

Paula Fenger – University of Connecticut, 2020

Words within Words: The Internal Syntax of Verbs

Paula Fenger

University of Connecticut, 2020

This dissertation is an exploration of the syntax-PF interface, in particular how functional syntactic material is mapped into different PF units, specifically the word. The empirical domain is verb and auxiliary patterns, as this particular domain has rich variation in whether tense, mood, aspect and valency changing morphology is expressed in single or multi-word constructions.

On the surface the choice for an inflectional category being expressed as auxiliary or affix seems arbitrary. In this dissertation, however, I argue that it is not as arbitrary as it may appear. I explore how the expression of features in one or more words can differ systematically cross-linguistically and propose that syntactic word-formation is sensitive to syntactic domains (phases). In order to do so, I approach this problem from various angles. Chapter 2 focuses on an in-depth investigation of two head-final languages (Japanese and Turkish) and mismatches between syntactic and phonological word-hood tests. I show that these mismatches follow from particular word building processes and their interaction with syntactic domains. Hence these mismatches are not arbitrary. Chapter 3 explores the status of word building operations, and the idea that timing differences in the derivation lead to variation in auxiliary patterns. I provide evidence that auxiliary patterns in a language pattern with other phenomena that align with the timing of word building, such as matching constraints in ellipsis. Chapter 4 focuses on correlations between domains in word building and domains in the syntax, i.e., correlations between auxiliaries and phases. Finally, chapter 5 explores which inflectional features are expressed in single or multi-word expression in a cross-linguistic sample of 33 languages from 18 families. I show that inflectional categories inside the first phase do not participate in periphrasis.

I show that there is more uniformity than initial appearances suggest in the expression

of features as single words or periphrastic constructions, and that there may be universal aspects to the analysis. Furthermore, the apparent mismatches between phonological and syntactic tests for word-hood are in fact regular consequences of the relevant processes and their timing pointing to the need for a more integrated approach to cross-modular research.

Words within Words: The Internal Syntax of Verbs

Paula Fenger

B.A., University of Amsterdam, 2012

M.A., University of Amsterdam, 2014

M.A., University of Connecticut, 2018

A Dissertation

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Doctor of Philosophy

at the

University of Connecticut

2020

Copyright by
Paula Fenger

2020

ii

APPROVAL PAGE

Doctor of Philosophy Dissertation

Words within Words: The Internal Syntax of Verbs

Presented by

Paula Fenger, B.A., M.A.

Co-Major Advisor _____

Jonathan David Bobaljik

Co-Major Advisor _____

Andrea Calabrese

Associate Advisor _____

Asia Pietraszko

Associate Advisor _____

Susanne Wurmbrand

University of Connecticut
2020

Dedicated to the loving memory of
Opa Hugo,
Hugo-Jan van der Kaay (1929-2018),
who taught me to always keep asking questions

Hec: 'Pretty majestic, aye?'
Ricky Baker: 'I don't think that's a word.'
Hec: 'Majestic? Sure it is.'
Ricky Baker: 'Nah, it's not real.'
Hec: 'What would you know?'
Ricky Baker: 'It's majestic.'
Hec: 'That doesn't sound very special, majestic's way better.'

—*Hunt for the Wilderpeople*,
Taika Waititi

Acknowledgements

It's a weird feeling to be at the end of six years of graduate school: it feels... amazing, great, good to be over, sad to be over, like it took forever, but also as if it was only yesterday that I arrived in 2014. Many moments felt like David Bowie's five years: 'We've got five years, my brain hurts a lot / We've got five years, that's all we've got', but at the same time it does not feel like that at all (and the world, even though 2020 is an odd year, hasn't ended); time flew by because I had such a great time. One of the most important things I learned is that in order to be a 'serious' linguist, it is important to not take yourself too serious. UConn is a great place for that: a place where there is room to discuss the details of <insert Favorite Mechanism of Important Theory>, discover new data, make interesting connections, while at the same time it is a relaxed environment to do all this. One other important part in doing research is being surrounded by great people.

First of all, I want to thank my two co-major advisors, Jonathan Bobaljik and Andrea Calabrese. Jonathan has been my advisor from when I started the program at UConn, and I couldn't have wished for someone better. He is someone who listens very carefully to what you have to say, and then gives some comment you did not think about before. His feedback to my drafts was extremely useful, and, a lot of the time, very funny. You know you're doing something right when he says 'coool', and you know you have to work at explaining something better when he frowns, throws back his head, and puts his hands on his nose ridge. Apart from doing research, I also admire his teaching style: he makes sure that you never take anything for granted, and that sometimes something is just a 'notational variant'. Finally, I find it very fitting that one time he was late for a meeting because there was a moose on the road.

I have to say that when I met Andrea for the first time, he scared me: he told me in a grumpy voice, in my first month at UConn when presenting in a reading group, that my joint work with Ava and Jan was wrong. I later learnt that Andrea is one of the smartest and nicest people in the department (and far outside of it too). During meetings he would tell me I would be wrong, how he would solve it, say I should definitely not use his analysis, and end with saying how he learned a lot and that my work is great. His best advice after reading one of my drafts was that 'You should think before you write!' (I try...). As a teacher he would make sure you knew what you learned and what you still needed to learn: during our first year when we complained how one Phonology II homework was way too difficult, he would giggle and say 'I know!!'.

I was very glad that Susi Wurmbrand and Asia Pietraszko were part of my committee as well. Susi was the best Syntax I teacher you can imagine—I disliked her binding homework so much that it is something I want to include when I get to teach syntax, because it is such a great homework. Talking to Susi about my work was always very rewarding, especially when she was very critical. I did not only learn how to think about testing particular constructions, she also helped me to develop how to write and present well. Asia has been part of my academic life for the past three years and I couldn't have been happier. She is very critical, but always makes sure you understand why something is criticized. My work has gotten a hundred times better because of her comments and my discussions with her. She taught me to trust my instincts: in one of our first meetings she pushed me to think why a certain analysis of a morpheme was important and made me explain why I thought so. Apart from linguistics, I'm also grateful that we got to share the experience a class of a 'great' yoga teacher, who made us so stressed we needed beer to relax afterwards.

Besides my committee, there are various people who have been important during my education as well. First of all, I want to thank Željko Bošković. Even though he has not been part of my official committee, he has given useful feedback on almost all the projects that I did during my time here. He's always excited about new pieces of data and insights, and taught me how to see interesting connections; he is a cheerleader for your work, someone should get him some pompoms. Second, Ian Roberts is, just as Željko, someone who also was not part of my official committee, but has been a great influence on my thinking. I'm glad he got to be a part of UConn for many years! He made sure Ksenia, Adrian and I knew that Arapaho is exactly the same as Old Irish, and I'm sure that in the future he'll teach us that this will hold for every language (or maybe more like Old English).

During my BA and MA in Amsterdam I had various people that had a lot of influence on me becoming the linguist I am today. First of all, Suzanne Aalberse. She was my first linguistic teacher, and ended up being my MA thesis advisor. I was happily surprised to learn that linguists are weird and funny and can do very serious work at the same time: while critically evaluating my analysis for the thesis, we were making sure I also had the perfect serious-but-funny title. Jan Don is someone who taught me, just as Suzanne, that linguists can be serious and fun at the same time. Jan has been one of the people who helped me realize that I would be good at linguistics and should do a PhD in the United States. I also very much enjoy working with him and Ava Creemers on Dutch morphology, and hope that our collaboration will continue in the future. Hedde Zeijlstra is a great teacher, and above all, someone who is ready to help people when they most need it. I met Enoch Aboh as an inspiring teacher during my MA program. He taught a course on cross-linguistic variation in tense, mood, and aspect marking from various theoretical perspectives. I did not like it at all—which had nothing to do with Enoch, nor with the topic, nor with the way he taught it. At the time I thought: 'who would want to look at all this variation, they would have to be insane.' It was great to have Enoch be a part of my defense to show him how I was, in the end, the 'insane' person who wrote a thesis on cross-linguistic variation in tense, mood, and aspect marking. Finally, even though not in Amsterdam, Ad Neeleman was one of my advisors for my MA thesis. He told me that 'I will be wrong, whatever I write' which has been the best advice anyone has ever given me.

I have been lucky to have been part of three departments throughout my career. At the University of Amsterdam I learned many things from Fred Weerman, Jeannette Schaeffer, Sible Andringa, Olaf Koeneman, Simone Buijs and Caitlin Meyer. The days Simone, Caitlin and I spent drinking coffee, grading homeworks, listening to recordings of acquisition experiments and talking about linguistics were among the most fun during my time in Amsterdam.

At UConn I had the pleasure to be taught by, and have enlightening conversations with, Stefan Kaufmann and Laura Kalin (both of who I was lucky to have on my generals committees), Jon Gajewski, Magda Kaufmann, William Snyder, Diane Lillo-Martin, Harry van der Hulst, Jon Sprouse, Mamoru Saito, Guglielmo Cinque, Jairo Nunes, Tammy Stark, Philipp Weisser, and Nadine Theiler. Second, the first year was made much easier by discussing homeworks with my cohort Laura Snider, Sabine Laszakovits, Christos Christopoulos, Aki Arano, Hiroaki Saito, and Ksenia Bogomolets. And, third, I enjoyed office time, coffee breaks, and discussion of papers in reading groups with Aida Talic, Ivana Jovović, Sarah Asinari, Chantale Yunt, Yuta Tatsumi, Beccy Lewis, Penelope Daniels, Robin Jenkins, Shuyan Wang Si Kai Lee, Teru Mizuno, Muyi Yang, Christiane Müller, Christos Christopoulos, Troy Messick, Abbie Thornton, Gísli Rúnar Harðarson, and Zheng Shen. Finally, I would like to thank Tamara for all her help with anything non-linguistic related.

I had the pleasure to be at Harvard University for a couple of semesters, and learned a lot from

Ian Kirby, Shannon Bryant, Kathryn Davidson, Tamisha Tan, Masoud Jasbi, Hande Sevgi, Helen Lewis, Karen Lounsbury, and Luke Adamson. I met Luke already years before, when he was at UPenn, and always enjoy talking to him about (non)-linguistic issues.

I'm glad that my fourth linguistics home will be Leipzig University for the next couple of years, and I am looking forward to meeting everyone there.

Being at three departments that are all very international, it was very easy to do cross-linguistic work. I like to thank the following people for sharing their language with me. Hiromune Oda, Yuta Tsatsumi, Yoshiki Fujiwara, Hande Sevgi, Güliz Güneş, Teru Mizuno, Guglielmo Cinque, Nadine Theiler, Christos Christopoulos, Ksenia Bogomolets, Sarah Asinari, Jayeon Park, and Zheng Shen.

Throughout the years I got inspired by many people, even if they don't know it, and some people deserve special mention. Marijke De Belder taught me to speak up: she told me, when I asked her a question after my first conference, that it was a good question and that I should speak up more during the question period. I learned from Jenneke van der Wal how to answer questions after a talk well: before answering questions during her talk at UConn in 2017, she first situated and explained the questions that were asked. Something similar I learned from Klaus Abels when meeting with him: he told me to assume that the other person does not know what you are talking about, so I should talk about my work in a clear and simple way (I am not sure I always succeed at that). Vera Griбанова gave a talk in the spring of 2020 at Harvard. She taught me that it is OK to have a viewpoint on a topic that is not popular with everyone, and that it is still fruitful to pursue angles that might not seem interesting to everyone. I'm thankful to Miloje Despić for taking the time to help me apply for a fellowship, and for showing me my work is of interest. I was very lucky that Norbert Corver was at UConn for a semester, during which time he gave a seminar which was one of the best classes I attended, and taught me that little things are very interesting. Finally, I want to thank someone I never met in person: Peter Ackema. He is someone whose work I admire, and he is the only person in linguistics I had paper-mail contact with: he sent me his dissertation and a paper, both of which were very important for two of my projects.

Other people I would like to thank, in no particular order: Kyle Johnson, Donca Steriade, Coppe van Urk, Mitcho Erlewine, Doreen Georgi, Riny Huybregts, Larry Hyman, Sjef Barbiers, Jeroen van Craenenbroeck, András Bárány, Yinning Nie, Marlijn Meijer, Karlos Arregi, Brownwyn Bjorkman, Omer Preminger, Rolf Noyer, Rajesh Bhatt, Gary Thoms, Ruth Kramer, Heather Newell, Amy Rose Deal, Martina Wiltschko, Boris Harizanov, Norvin Richards, Lisa Selkirk, Peter Svenonius, Tom Leu, Richard Kayne, Nico Baier, Michelle Yuan, Marjo van Koppen, Elizabeth Cowper, Andrew Nevins, Mikael Berger, Anders Holmberg, John Whitman, Theresa Biberauer, Michelle Sheehan.

Some people in the linguistics community have become very close friends (despite being oceans apart). I am very happy Ksenia Bogomolets and I got to be in the same cohort. Luckily, being on different sides of the world has not stopped us (and Adrian) from working together! I always enjoy spending time with Gísli Rúnar Harðarson, and am glad that we found a way to stay in touch (by working on Germanic, cheese, and diapers, how else). Zheng Shen is one of the kindest people I have ever met, and is great at walking (sliding?) down the stairs in a Dutch house. Ava Creemers, finally, is someone, who deserves special mentioning. We have been going through all the same steps: BA, MA, PhD, and writing multiple papers together. Of course, the best part is that we are part of the Stammpot-Chunky cat family.

Being in the forest of Connecticut meant sharing a house with Yuta, Christos, Ksenia, Yoshiki, and Lily. This also meant having fun dinner parties with Ivana. I enjoyed having a home away from home, especially with Yoshiki and Lily. I will miss our magnet collection, watching Rick and Morty, the puzzles, Yoshiki's tonkatsu, yoga practice, Lily's chicken, jazz music and scented candles.

The last eight months I was very lucky to live together with Adrian in Stefan & Magda's house in the middle of the forest. It was the ideal place to write this dissertation, only being distracted by the various animals (deer! turtles! birds! foxes! turkeys! hummingbirds! skunks! coyotes!). Of course, the negative part is that we could not continue having dinners with Magda & Stefan and Tobias & Sebastian! This place has also been the perfect place to enjoy my last summer, especially the last two months with Beccy and Sarah. I've learned that confidence and apple cores are miraculous.

Writing this dissertation could not have been possible without music of (in random order) Beethoven, ABBA, dEUS, Patti Smith, Nick Cave and The Bad Seeds, Thievery Corporation, Bach, Satie, and David Bowie. Also playing my flute has been important in keeping me sane. Eva Maria Schuster is someone who is a great teacher, and I am happy to be closer to her again, so that we can talk about the many interpretations of Poulenc's flute sonata, and the similarities (not always positive!) between the music word and the academic world.

There are people that like to stay away from linguistics as much as possible, but have been supporting me anyway. Despite the fact that Marieke, Helena and I do not live together in the same house anymore, I am happy we talk on an (almost) daily basis. Whenever I see Rosanne or Tim, it's like no time has passed. Finally, Iris is someone's company I always enjoy, and I'm looking forward to seeing her family grow. There are many other people (and pets) I want to thank, among which are Ben, Yvonne, Chadai, Leontien, Roy, Danielle, Dagmar, Antoine, Hiltjo, and Opa Hugo.

I want to thank Peter Kuin, Chetan Joshi, and Jonathan Beazley for their help with my mental health. The conversations with them over the years is what helped me to stay sane.

I thank my parents, my brother, and Kerel and Moorkop (yes pets are important). Papa is not someone who is good with compliments, but one of the biggest signs of trust I got from anyone was when he read the first line of my BA thesis and told me he did not know what a morpheme was (in opposite to the many other (non-linguistic) people who told me that 'I can expect feedback on my BA/MA/dissertation soon'). I love Mama and I wish I will be as nice, calm and open as her one day. I always enjoy meeting up with Rob and create new things —music or a present for our parents. Despite the disappointment that I had to defend online, one of the many positive parts of an online defense was that my family could be part of it (even though they might have regretted it afterwards). I'm glad that the next couple of years I will get to be closer to them again.

Thank you, Adrian Stegovec and Stampot. I never intended to get a cat, but when visiting Ava, Stampot made me fall in love with him. He is the perfect cat, and made working on the dissertation much easier, despite the fact that he loves walking over my keyboard (all typo's in this disseffdllrtation arr his). Lastly, I want to thank Adrian. He has been the one person who I shared all my excitement, worries, ramblings, victories, tears, and joy with. I never met anyone who has been more understanding, patient, and fun. Despite having written a whole dissertation on words, I cannot describe in anything other than generic terms how much Adrian means to me. Je bent lief.

Contents

1	Introduction	1
1.1	Verbs and auxiliaries	5
1.2	Main findings in the dissertation	8
2	Words and auxiliaries in Turkish and Japanese	15
2.1	Sorting out [V - X ₁ - X ₂] : one or more units?	19
2.1.1	Phonology and words in Japanese	20
2.1.1.1	Words in phonology	21
2.1.1.2	Syntax and words in Japanese	34
2.1.2	Turkish	42
2.1.2.1	Phonology and words in Turkish	43
2.1.2.2	Syntax and words in Turkish	48
2.1.3	Taking stock	54
2.2	(Im)possible feature combinations	55
2.2.1	Japanese	56

2.2.2	Turkish	58
2.3	Proposal and derivations	61
2.3.1	Synthesis versus periphrasis	62
2.3.2	Words within Words	72
2.4	Conclusion	79
3	Words and head movement	81
3.1	Typology of movement and predictions	85
3.1.1	The First Phase	87
3.1.2	The Second Phase	102
3.1.2.1	Input: Single Phonological Word	105
3.1.2.2	Input: Single Syntactic Word	107
3.1.2.3	Input: Multiple Syntactic Words	109
3.1.2.4	Input: Phonological and Syntactic Words	125
3.1.3	Summary and predictions	137
3.2	Testing Predictions I: Movement before/after Spell-Out	141
3.2.1	Verb-stranding Verb Phrase ellipsis and verb matching	144
3.2.2	Extraction and domain size	157
3.2.3	Previous arguments in Japanese for Head Movement in syntax	161
3.2.3.1	Do Support	161
3.2.3.2	Multiple Scrambling	166
3.2.4	Summary and taking stock	169
3.3	Testing Predictions II: Head Movement in two cycles	170
3.3.1	Mismatches with VP ellipsis	172
3.3.2	Syntax-Morphology mismatches and verb height	177

3.3.3	Summary	184
3.4	Testing Predictions III: Syntax and its interfaces	185
3.4.1	Morphological interaction: Suppletion	186
3.4.2	Phonological Interactions	187
3.5	Conclusion	191
4	Words, auxiliaries, and phases	192
4.1	Phases and word formation	196
4.1.1	The role of Aspect	196
4.1.2	What gets sent to Spell Out?	200
4.1.3	Building a synthetic and a periphrastic verb form	203
4.1.4	Phases and words	207
4.2	Correlations between auxiliaries and phrasal constituents	210
4.2.1	Verb Fronting	211
4.2.2	Particles	219
4.2.2.1	Turkish	220
4.2.2.2	Japanese	225
4.2.3	VP ellipsis and adverb interpretation	233
4.2.3.1	English	233
4.2.3.2	Japanese	236
4.3	Auxiliary formation and intervention	242
4.3.1	Voice, Passive and phases	248
4.4	Conclusion	252
5	Auxiliaries cross-linguistically	253

5.1	Methodology	259
5.1.1	Data Collection	260
5.1.2	Working definitions for Inflectional categories	263
5.1.2.1	Voice, <i>v</i> , and valency changing morphology	264
5.1.2.1.1	Verbalizing features	264
5.1.2.1.2	Valency changing features	265
5.1.2.1.3	summary of <i>v</i> and voice	266
5.1.2.2	Aspect	267
5.1.2.2.1	Viewpoint Aspect	267
5.1.2.2.2	Lexical Aspect	270
5.1.2.2.3	Perfect	271
5.1.2.2.4	Summary of aspect	272
5.1.2.3	Tense	273
5.1.2.4	Mood and Modality	274
5.1.3	Summary and what is to come	275
5.2	Data patterns	276
5.2.1	<i>v</i> , voice, and valency changing heads	281
5.2.1.1	Passive	283
5.2.1.2	Other valency changing morphology	288
5.2.2	Aspect	292
5.2.2.1	Lexical Aspect	295
5.2.2.2	Viewpoint Aspect	302
5.2.2.3	Perfect	315
5.2.3	Tense	319

5.2.3.1	Past/Present	320
5.2.3.2	Future	324
5.2.4	Mood and Modality	326
5.3	Generalizations over the whole domain	328
5.4	Conclusion	333
6	Conclusion	334
	Bibliography	360

1

Introduction

This dissertation explores the complex interactions between syntax and the form-related modules of grammar: morphology, phonology, and prosody. In particular, I consider how syntactic elements are mapped to different units in these modules, focusing primarily on what we intuitively label as *words*. The empirical domain where this issue is particularly relevant is the expression of functional syntactic categories in the verbal domain, where tense, mood, aspect and valency changing morphology can cross-linguistically be encoded either via affixes and clitics on the verb or periphrastically as auxiliary verbs. In other words, these categories are expressed as either part of the same word as the verb or as separate words. Variation in the expression of verbal morphology is relevant here due to the large number cross-linguistic possibilities and the fact that the coexistence of multiple

functional morphemes is more commonly found with verbs than with other lexical categories.

The key theoretical issue explored in the dissertation is whether it is possible to defend the position that the word is a coherent unit of grammar. On the surface at least there seems to be variation in whether we get consistent mapping between syntactic, morphological, phonological, and semantic units. This can be illustrated with the sentence in (1) in relation to the difference between the highlighted ‘words’: *vampire* and *couldn’t’a*.

- (1) “Ran inter a couple o’ mad trolls on the Polish border an’ I had a sligh’ disagreement with a **vampire** in a pub in Minsk, bu’ apart from tha’ **couldn’t’a** been smoother.”

(*Harry Potter and the order of the Phoenix*, chapter 20, p. 377)

The orthographic convention used here is that spaces correspond to word boundaries. However, note that the two ‘words’ in question are very different when it comes to the correspondence between the information they encode at different grammatical levels. In the ideal cases, syntax, morphology, phonology and semantics all align and pick out the same string. This can be informally illustrated for *vampire* as in (2).

- (2) /vampire/

- | | |
|---|--------|
| a. Syntax: N | 1 unit |
| b. Phonology (/ 'væmpaɪər /) _ω | 1 unit |
| c. Morphology: [vampire] _{x⁰} | 1 unit |
| d. Meaning:  | 1 unit |

The string *vampire* corresponds to a single unit in the syntax, namely a syntactic head of the lexical category *noun* (N), (2a). In the phonology, it corresponds to a single phonological word, (2b). Similarly, the same string also corresponds to a single indivisible morpheme in the morphology, (2c), and a single unit in the semantics, where the lexical meaning of the unit can be very informally represented with the picture in (2d).

Thus, *vampire* is mapped to the same number of units across the different modules of grammar. However, this does not hold for all of the strings that are orthographically singled out as words in (1). There are many cases where the correspondence between units at the different grammatical levels does not align in one or more cases. A clear example of this is *couldn't'a*, as schematized in (3).

(3) /couldn't'a/

- | | |
|---|--------------|
| a. Syntax: [TP T _[PST] [NegP Neg [VP V _{can} [VP V _[PRF] [VP ...]]]]] | 4 units |
| b. Phonology (/'kʊdntə/) _ω | 1 unit |
| c. Morphology: [[[can+PST] _{x⁰} = NEG] _{x⁰} = PRF] _{x⁰} | 1 + 2? units |
| d. Meaning: $t < s^*$ (PST), \neg (Neg), \diamond (can), $t' \subseteq t$ (PRF) | 4? units |

Even though there is a single unit in the phonology—the phonological word in (3b)—there are at least four units in the syntax, and either the same number or more units in the semantics; although (3d) is not a real semantic representation, what it highlights is that the string corresponds to at least as many semantic components as there are syntactic units. In the morphology, it is not immediately clear what the units are. The fact that *could-* is an allomorph of *can* in the context of past tense (PST) shows that the two components constitute a morphologically relevant unit. In contrast, the status of the negation and the perfect morphemes is not as clear, since they can also occur as independent phonological units and crucially do not interact morphologically with *could-*. What is crucial here is that we have a word-like unit in the morphology (*could-*) that is contained within another word-like unit in phonology (*couldn't'a*). What we see in this example is what can be described as being a *word within a word* configuration.

Determining what governs the correspondences and mismatches between the basic units of the different modules is a very old problem (see for example Sapir 1921, Bloomfield 1933) and one that is still very much debated (see for example the papers in Dixon and Aikhenvald 2002). However, the main two theoretical options can be summarized fairly straightforwardly. The first option is to take *vampire* as the basic example and *couldn't'a* as the exception and therefore takes ‘words’ as

coherent units of grammar. The burden of such approaches is to find principled explanations for the occurrence of the mismatches. The second option is to take *couldn't'a* as the basic example and *vampire* as the exception. This essentially implies an ‘everything goes’ approach to mapping between the units from different modules, where ‘words’ are not treated as coherent units of grammar; cases like *vampire*, where all the units align are therefore coincidental. If it turns out that there are generalizations, cross-linguistic or language internal, in the mapping between the units, then such an approach would also have to treat them as coincidental. I will show in this dissertation that there are indeed both cross-linguistic and language internal generalizations of the relevant kind and furthermore that the mismatches can be explained in a principled way. Based on this, I will argue for a version of the first option.

When seeking to identify such generalizations one needs to exercise great care. One cannot know a priori which module of grammar will determine the unit boundaries we are looking for, so focusing on only one module of grammar runs into the risk of privileging it when interpreting the data and as a result potentially missing important cross-modular generalizations. In other words, one needs to look in detail at the syntax, morphology, and phonology of all the relevant cases, which is what I do in this dissertation.

A sufficiently careful examination of the interaction between syntax, morphology, and phonology is only really possible by closely examining a manageable number of languages. Because of this, a large part of this dissertation will concern itself with such in detail case studies. However, by only looking at a few specific languages in depth, we run into the danger of missing generalizations that are only identifiable by comparing languages on a larger scale. In order to avoid running into this issue, this dissertation will also include a large-scale typological study. As my primary theoretical concern is whether or not there is a unified formal way of describing what cross-linguistically counts as a word, this study will be conducted using the methodology of what has come to be known as *Generative Typology* (Baker and McCloskey 2007, Baker 2010, Cinque 2007). In other words, the study will combine the insights of traditional typological works with the insights of the formal tools employed by syntactic approaches in the generative tradition. The balancing of the tension

between in depth cross-modular investigations of a select number of languages with the large-scale typological study is what sets this dissertation apart from previous works on related issues.

I argue in this dissertation that a coherent notion of ‘word’ is tenable, and that it is built in the syntax, i.e., a *syntactic word*. Maintaining a uniform notion in turn informs the mapping relations between the syntax and morphology and phonology. Specifically, it is argued that syntactic words can be built in several cyclic steps and are delimited by spell-out domains, phases (Uriagereka 1999, Chomsky 2000, 2001). In order to show this, this dissertation looks in detail at various mismatches between syntax and phonology, and it is proposed that these mismatches arise from timing differences in the word-building operation. That is, even though there is a unit in the syntax that is coherent across modules, it is possible to form larger units during spell-out or phonology. This has implications for the post-syntactic component(s) of grammar, which potentially involves multiple operations that map syntactic structures and features to a phonological representation through a series of derivational steps. In the remainder of this introduction the main empirical domain where this will be explored, verbs and auxiliaries, is discussed in Sec. 1.1, and the main findings for each of the chapters will be given, Sec. 1.2

1.1 Verbs and auxiliaries

The main empirical focus in this dissertation where the notion of a ‘word’ and the mapping between syntax, phonology, morphology, and prosody are explored are verbal constructions. The reason is that in the verbal and inflectional domain there is rich variation in how inflectional categories are expressed and there are potentially many cases of (non-)mismatches between syntax, morphology, and phonology. An example of the variation is given in (4-6) for three different languages.

- (4) Zonder Adriaan **zou** Bassie de schat niet **hebben kunnen vinden** [Dutch]
 Without Adriaan would Bassie the treasure not have could find
 ‘Without Adrian Bassie could not have found the treasure’
- (5) [laud -a -**u** -i -s -s -e -mus] [Latin]
 praise -TV -PRF -TV -PST -SUBJ -TV -1.PL
 ‘Would we have been praised’ (Embick and Halle 2004)

- (6) [[ver -il -ebil -'ir] -di] [Turkish]
 give -PASS -ABIL -HAB -PST
 'it could be given to him/her'

Each of these languages, Dutch (4), Latin (5), and Turkish (6), expresses categories such as *Tense, Aspect, Mood (TAM)* and *Valency Changing/Voice* categories in a superficially different way. First of all, features can be expressed in separate units: in Dutch tense, mood and aspect are expressed periphrastically, (4). On the other hand, these features can also be expressed in a single unit, as affixes, which is for example the case in Latin, (5). There are also cases, where there seems to be a single unit, as in Turkish (6), but the non-final stress in an otherwise stress-final language suggests that there is more going on. Thus, as I will argue in Ch. 2, this single unit does not only consist of affixes as in Latin. In a way, the verb form in Turkish is similar to the mismatched case *couldn't'a* in (3): it is a *word within a word*.

On the surface languages differ arbitrarily in which choice they make: for example, both Turkish and Dutch are head final languages, but one language represents TMA material on the surface as affixes, whereas the other represents this material in separate units. However, in the dissertation I explore how word building differs systematically across languages. By looking at verbal constructions cross-linguistically I argue that a coherent notion of 'word' is tenable, and that it is built in the syntax, i.e., a *syntactic word*. In order to argue for this result, I approach this problem from various angles.

First of all, I conduct an in-depth investigation of syntactic and phonological word-hood tests in two head-final languages, Japanese and Turkish. That is, in order to determine that Turkish has words-within-words, whereas Dutch has periphrastic constructions, and Latin affixal constructions, I look in detail at the phonological and syntactic properties of constructions as in (6). The result of this investigation is that Japanese and Turkish are far less agglutinating than generally represented, and are in many respects similar to Dutch and English. Even though there seems to be variation in what constitutes a word, i.e, phonologically or syntactically, there is in fact considerable regularity in the syntax among languages, but this regularity might be masked in certain contexts, namely in the phonology or because certain morphemes have a different status. The timing of this word

building operation is what can result in the partial obscuring of the underlying syntax and can create mismatches.

Second, I explore two main theoretical ideas that are put forward to account for the verbal patterns in Turkish and Japanese, related to word building and domains. I argue that word building consist of a single operation that puts units together, and this mechanism can apply at various stages of the grammar: syntax, morphology or phonology. Crucially, I argue when it applies in the syntax after phasal material is sent to the interfaces, the phase head blocks movement. I provide detailed derivations and the expected variation with regard to verbal synthetic and periphrastic patterns. I show that this approach has implications for the post-syntactic component(s), and word building potentially involves multiple operations that map syntactic structures and features to a phonological representation through a series of derivational steps. The result is that periphrastic and synthetic word forms should be indicative of the timing of movement, and makes predictions about other phenomena that are not related to word building. For example, the model proposed here makes predictions about matching restrictions on verbs and inflectional material in ellipsis contexts which I show are borne out.

The other major theoretical contribution is concerned with domains and builds on the idea that word building can be delimited by phases. If we take serious the idea that words can be built in the syntax, there should be evidence for correlations between word building and phrasal phenomena. I test the prediction that words are delimited by phases by looking at other phenomena that have been accounted for with phases, such as fronting and ellipsis patterns. I argue that this confirms previous ideas that there is a phase boundary at aspect.

After exploring implications from word building for the syntax and the phonology in a couple of languages, a larger cross-linguistic study is also conducted. I establish the (limits) of variation of which tense, mood, and aspect features can be expressed in single or multi-word expressions in a cross-linguistic sample of 33 languages from 15 families and 3 isolates. I show that when a language expresses Lexical Aspect and valency changing morphology categories with a dedicated affix only expressing that category (and not as a light verb such as *make* or *begin*), these categories

do not participate in periphrasis. This might be surprising considering that there is no a priori reason for these categories to be always expressed as an affix on a verb, rather than hosted by a dummy auxiliary. I argue that this follows from the proposal in this dissertation that word building operations can be blocked by phases.

I argue, that among all the variation it is possible to show that syntax limits word building, but that this can be masked in various ways in the post-syntax. First of all, I propose that phases can play a role in delimiting word-formation processes (chapter 2), I show how periphrasis correlates with various phrasal phenomena (chapter 4), and I show how this approach can further our understanding of why certain tense mood and aspect features never play a role in periphrasis (chapter 5). Second, this dissertation focuses on different word building processes, including head movement, and concludes that movement can take place in different components of grammar (chapter 3), and that there are word building processes that mask the output of the syntax (chapter 2 and 3). Crucially, this has implications for the post-syntactic component(s) of grammar, which potentially involves multiple operations that map syntactic structures and features to a phonological representation through a series of derivational steps. The main results are summarized below for each of the chapters.

1.2 Main findings in the dissertation

The first issue that is discussed, in Chapter 2, focuses on word building by looking at various considerations from both the phonology and syntax. It deals with a puzzle in two head-final agglutinating languages, Japanese and Turkish. An example is shown in (7) for Turkish. In the first example, with a causative and tense morpheme there is a single domain for vowel harmony (the vowel in the past tense morpheme harmonizes with the verb stem), and a single domain for stress, i.e., it falls on the last syllable. In the second example there is a mismatch: again there is a single domain for vowel harmony, but stress seems to fall in the middle of the word, on the aspect marker. In other words, there is a bigger word-unit for vowel harmony than for stress, and stress can fall in

the middle of this bigger unit.

- (7) a. [koş -tur -'du]
 run -CAUS -PST
 'x made y run'

(based on Kornfilt 1997, 331)

- b. [[kal -'iyor] -du]
 stay -PROG -PST
 'was staying'

First of all, I show that this pattern cannot be due to phonology only. If that is the case, this state of affairs could be surprising if all of these words are built in the same way. I show that there is evidence for a difference in the amounts of syntactic units between (7a) and (7b) by using syntactic tests. That is, I use various constituency tests to show that the verb plus the aspect marker behave as a single syntactic unit, similarly to the verb, causative and tense marker.

The second part of this chapter focuses on the question why the content of the morphemes matter, i.e., why do some morpheme (combinations) lead to a single unit, whereas others lead to more. Taking into account tests for word-hood, I show that the combinations that are allowed in a single unit are in fact very regular and predictable in both Turkish and Japanese. When morphemes like in (7) need to be expressed, voice, viewpoint aspect or tense categories can all attach to the verb; when there is a combination of viewpoint aspect, tense, or mood morphology, the morphemes higher in the clausal spine are expressed outside of the syntactic verb-word.

I provide an analysis where aspect counts as a phase head, following various proposals that have argued for aspect as a phase (Aelbrecht 2010, Harwood 2013, 2015, Aelbrecht and Harwood 2015, Wurmbrand 2017). This phase head can be removed when it is not specified for any features, to derive simple tense forms. Second, I argue that even though syntactic words map onto phonological words, it is possible to create larger phonological words. I propose that this is done via a version of local dislocation (Embick and Noyer 2001, Embick 2007, Shwayder 2015).

Thus, the result of this investigation will be that Japanese and Turkish are far less agglutinating than generally orthographically represented, and are in many respects similar to Dutch and English. Even though there seems to be variation in what constitutes a word, i.e, phonologically or syntac-

tically, there is in fact considerable regularity in the syntax across languages, but this regularity might be masked in certain contexts, namely in the phonology or because certain morphemes have a different status.

Chapter 3 focuses on a different aspect of verb formation and auxiliaries, namely first of all by focusing on the status of movement with regard to word building. The first part of the chapter explores a possible typology of verb forms by exploring derivations where movement can take at different stages of the derivation. I assume that there is a single movement operation which can apply at different stages of the derivation (building on proposals that argue movement can take place in the syntax or during spell-out Rizzi and Roberts 1989, Matushansky 2006, Harizanov 2014, Harizanov and Gribanova 2019). Specifically, I assume that in the syntax there is a choice and languages differ in whether head movement applies before or after Spell-Out. This leads to various different outputs, for example in languages like English and Turkish versus languages like Greek or French. This specific choice in the derivation is tested by looking at matching constraints in verb stranding ellipsis. Crucially, looking at matching constraints in ellipsis makes it possible to test head-final languages as well. The output of head movement in the syntax or not would yield the same surface result in the morphology of such languages. (8) illustrates this point, where the verb forming a complex head with T or not yields the same surface result.

- (8) a. [ADV [VP O V] T]
 b. [ADV [VP O Ψ] V-T]

I provide arguments that in Japanese and Turkish there is movement after spell-out, along the lines of English. I provide evidence that both Japanese and Turkish allow for this type of construction, and second of all, that the patterns found in these languages pattern with those languages that have verb stranding ellipsis where it can be shown that head movement takes place after material is sent to the interfaces. This means that head final languages can be used in the debate on head movement, and where it takes place. This is important, since it is quite tricky to find evidence for one or the other type of movement in these languages, because they are head-final.

A second prediction made by the proposal that movement takes place at different times during the derivation, it means that (synthetic) verbs can be built in a single phase, or in two phase-cycles. I provide a way to test this assumption by looking at other phenomena than word-building, such as identity requirements of inflectional material in ellipsis constructions. Finally, moving in the morphology or phonology creates various syntax-phonology mismatches, similar to those discussed for Japanese and Turkish in the previous chapter and I discuss additional evidence for these predictions. Thus, I show assuming word building at these steps in the derivation leads to variation which will be discussed in detail. Crucially, in the process of providing evidence for several of the assumptions, I show how this can be done also for languages where this has been hard to do, namely head-final languages such as Turkish and Japanese.

Chapter 4 focuses on a different aspect of the proposal made in chapter 2, namely that phase heads can limit syntactic word formation. There is a discussion both in the morphological and the syntactic literature what heads count as phases, and what type of effects phases can have. One line of reasoning argues that phase heads occur inside ‘words’, and as such trigger domain effects for phonological processes (Marantz 2001, 2007, Marvin 2003, 2013, Embick and Marantz 2008, Newell 2008, Embick 2010, Newell and Piggott 2014, Creemers et al. 2018). On the other hand, it has been argued that phases delimit movement and word building processes (Li 1990, Wojdak 2005, Compton and Pittman 2010). The proposal made here sides with the latter approach, by exploring what limits the inner phase has for word building. I follow proposals that assume that Aspect can be part of the first, inner, phase. I argued that this can account for the auxiliary patterns found in chapter two regarding auxiliaries in tense-aspect combinations in Japanese and Turkish. If that is the case, it predicts that there should be other evidence for aspect being a phase in these languages. This has been done for English by Harwood (2014), where he shows that viewpoint aspect can be part of the inner phase, but the perfect cannot. He shows that there are correlations between the progressive being able to be elided, fronted, and be part of idioms (among other things), but the perfect auxiliary is not. (9-10) shows this for fronting.

- (9) If Darth Vader says that Han Solo was being stubborn, then ...
- a. [**being** stubborn] he was
- b. *[stubborn] he was **being**
- (10) If Luke says he would have fought hard, then ...
- a. [fought hard] he would **have**
- b. *[**have** fought hard] he would (Harwood 2014)

I show that there are similar restrictions in Japanese and Turkish, by looking at fronting phenomena (11a-11b) illustrates this for part of the Japanese paradigm where it is possible to front a verb with the aspect marker, but not with the tense marker), restrictions on verb phrase ellipsis, and certain particle constructions in Japanese and Turkish.

- (11) a. [_{ASPP} aogaeru-o **tabe-te**-sae/mo/wa/dake] Kaonashi-ga *t*_{ASPP} si-**ta** [Aspect]
 Aogaeru-ACC eat-ASP-even/also/TOP/only No.Face-NOM do-PST
 ‘No Face was even/also/only eating Aogaeru’
- b. *[_{TP} aogaeru-o **tabe-ta**-sae/mo/wa/dake] Kaonashi-ga *t*_{TP} [Tense]
 Aogaeru-ACC eat-PST-even/also/TOP/only No.Face-NOM
 ‘No Face even/also/only ate Aogaeru’

The findings are interesting in that they establish correlations between where auxiliaries occur in Japanese and Turkish, and how constituents are picked out for phrasal phenomena. This then raises various questions as to how phases and spell-out domains are determined, which will be discussed in this chapter as well.

Ch. 5 focuses on a broad scale typological sample of 33 languages from 15 families and 3 isolates, and the distribution of tense, mood/modality, voice and aspect morphology. First of all, I show that there are various strategies to mark inflectional categories: they can be expressed as free or bound morphemes. This distinction is important, since the reason for periphrasis or synthesis might be different. When a category is expressed as a free morpheme, the cause of periphrasis might be due to the requirements of the element. However, the cause for periphrasis is different with bound morphemes. In this case, a morpheme like tense in (12a) always requires a verbal host and

can be expressed as an affix on the verb, but in combination with viewpoint aspect it is expressed as a dummy auxiliary, (12b). This means that the cause of tense being periphrastic is not due to the requirements of the tense morpheme, but rather it is due to the combination of tense and aspect.

- (12) a. [hedatar -ru] [Japanese]
 be.distant -PRS
 ‘(it) is distant’
- b. [hedata -te] [i -ru]
 be.distant -ASP AUX -PRS
 ‘It is being distant’

When taking this distinction between free and bound morpheme into account, the following pattern arises. When Lexical aspect or valency changing morphology is expressed as a bound morpheme, (and not as light verbs like *make* or *begin*), they never participate in periphrasis, (13).

(13) *Generalization I*

When *v*, Valency changing morphology, and Lexical aspect are expressed as a bound morpheme, they do not participate in periphrasis

This is surprising considering that there is no a priori reason for these categories to be always expressed as an affix on a verb, rather than hosted by a dummy auxiliary. In many descriptions or classifications, these categories are described as ‘derivational’ rather than ‘inflectional morphology. As has been pointed out in Pietraszko (2017) for Ndebele, only inflectional features seem to play a role in periphrasis. The question remains how this is encoded in a language. One way to do this, without invoking lexical features that classify a morpheme as [+/-inflectional] is with the proposal made in this dissertation: domains. That is, all heads that are part of the first phase participate in word building, but the phase boundary can limit this. I also discuss cases where the phase boundary does not seem to play a role: even though in the largest group of languages there is a split between aspect and tense visible with regard to periphrasis, there are languages where this is not the case. I discuss various scenarios which can mask this, such as different movement types in the language, and more in depth work regarding the meaning.

Second, this chapter also discusses variation among how many distinctions can be made per category. There is a tentative generalization that for the heads lower in the hierarchical structure all behave the same in a single language: In a given language there can be a difference between certain categories being expressed as free morphemes and others not, but all features that are expressed as free or bound morphemes behave the same. Again, this generalization could be different as well: it is entirely possible that a language would make a distinction between different types of valency changing morphology. Especially in frameworks where each feature is expressed in a different head/phrase (Cinque 1999) or in approaches where periphrasis is the result of morphological constraints or markedness features (Bjorkman 2011, Calabrese 2019). Even if more in-depth research is needed for some of these languages, it is interesting that there seems to be a tendency to make generalizations over classes of features rather than individual features.

Chapter 6 concludes, reviews the data and discuss how the analyses laid out in Chapter 2-5 can capture the data. Moreover, I provide implications for the interaction between syntax and phonology through the lense of word building processes, and discuss various options for future research.

2

Words and auxiliaries in Turkish and Japanese

This chapter focuses on the question of what constitutes underlying variation with regard to wordhood and what constitutes surface variation by looking at verbal paradigms. Consider as an illustration the following examples, (1) and (2). In a language like English or Dutch, Tense, Mood, Modality and Aspect material is generally expressed (at least orthographically) as separate words, (1). This same type of material is orthographically expressed as single words in languages like Turkish or Japanese, (2).

- (1) a. Without Sporty Spice the Spice girls **could** not **have made** so much money [English]
b. Zonder Adriaan **zou** Bassie de schat niet **hebben kunnen vinden** [Dutch]
Without Adriaan would Bassie the treasure not have could find
'Without Adrian Bassie could not have found the treasure'

- (2) a. ver -il -ebil -ir -di [Turkish]
 give -PASS -ABIL -HAB -PST
 ‘it could be given to him/her’
- b. hatarak -ase -rare -tagar -i -sugi -ru [Japanese]
 work -CAUS -PASS -WANT -EPENTH -EXCEED -PRS
 ‘Want too much to be forced to work’ (Sugioka 1984)

Even though Dutch and English represent TMA material as separate words, they differ with regard to word order: in Dutch most of the verbs are sentence final. Turkish and Japanese are similar in this respect to Dutch, in that the verb occurs sentence final too, but the TMA material is in this case represented as affixal.¹ Thus, it seems like there is variation between (1-2) in allowing one or more words, i.e. in allowing synthetic or agglutinating patterns, or also allowing periphrasis. However, the question here is how it is possible to know what constitutes a single word, and what constitutes as a periphrastic construction. Put differently this chapter focuses on the following type of constructions when there are two morphemes next to the verb as in (3). I discuss how it is possible to test if the correct analysis of these morphemes is as a single unit together with the verb, (3a), or if they are in fact separate from the verb, (3b).

- (3) V -X₁ -X₂
- a. [V - X₁] [X₂]
- b. [V - X₁ - X₂]

In order to look at this question, I investigate the phonological and syntactic behaviour of tense, mood and aspect morphology in Turkish and Japanese. Two factors will be important: the actual feature content of the features and the nature of the morpheme (being a bound morpheme that needs a host or a more freestanding element). As an illustration, some examples are given for Japanese with regard to different phonological behavior of various verbal morphemes. In the first example, with a causative and a tense marker, there is a single domain for pitch accent, i.e. all markers are

¹For Dutch there is in fact a debate how separate all the verbs are, since Dutch, like some other Germanic languages has what is called ‘verb clusters’, which are sometimes represented as separate words, with separate inflection, inside a single big word. The focus here is not on Dutch, but it is to show that, at least orthographically, Dutch verbs are represented as single units.

part of the pitch contour which ends on the tense marker, (4). The phonological breakdown is given in the (a.) example, and the morphological / syntactic breakdown is presented in the (b.) example. With a different feature combination however, progressive and tense, the pitch contour of the verb ends on the progressive marker and the tense marker is outside of this contour, (5). The pitch on the tense is still sensitive to the previous pitch contour, which means that there is an embedded phonological word structure, but morphologically and syntactically there is evidence that the tense morpheme ends up in a different syntactic word. Finally, in (6) there is a single contour for the verb, aspect, and tense, but in this case the aspectual marker is not directly attached to the verb, but there is an additional morpheme present in between the verb and the aspectual marker.

- (4) a. (L H H H H L)
 he. da. ta. ra. se. ru
 b. [hedatar -sase -ru]
 be.distant -CAUS -PRS
 ‘To make it distant’
- (5) a. ((L H H L) L)
 he. da. ta. te. ru
 b. [hedatar te] [-ru]
 be.distant -ASP -PRS
 ‘It is being distant’
- (6) a. (L H H H H H H L)
 he. da. ta. ri. ha. ji. me. ru.
 b. [[hedatar -i]-hajime -ru]
 be.distant -INF -begin -PRS
 ‘begin to be distant’

The examples show that depending on the morpheme combination the pitch accent pattern is different, and in some cases the morphological make-up as well. This would be surprising if all morphemes have the same status, and if all morphemes are always part of the same verb-word. On the other hand, the pitch accent patterns are not surprising if we assume the units delimited by the brackets in (4-5). I show that there is in fact evidence for a difference in the amount of syntactic units between (4) and (5) by using syntactic tests. That is, I use various constituency tests to show that the verb plus the aspect marker behave as a single syntactic unit, in (5), similarly to the verb,

causative and tense marker in (4). The example in (6) illustrates a different point: in this case I provide evidence that *hajime* is a different element from morphemes such as tense, aspect and the causative. That is, the latter type of morphemes are bound elements that always need a host, whereas *hajime* is best analyzed as a type of root, which has no such host requirements. This will be the focus of Sec. 2.1 for Japanese (Sec. 2.1.1) and Turkish (Sec. 2.1.2).

After establishing that what looks like mismatches between syntax and phonology actually follows from the way syntactic groupings are mapped into phonological units, the second part of this chapter, Sec. 2.2 focuses on the question why the content of the morphemes are important, i.e., why do some morpheme (combinations) lead to a single syntactic unit, whereas others lead to more. In other words, the focus is on the differences between periphrasis and synthesis. Taking into account tests for word-hood, I show that the combinations that are allowed in a single unit are in fact very regular and predictable in both Turkish and Japanese. When the morpheme is more root-like, as in case of *hajime*, the markers form compound like structures and it can combine with voice morphemes, tense or aspect. When morphemes are expressed as functional elements, voice morphemes, viewpoint aspect or tense can attach to the verb as in (4); when there is a combination of viewpoint aspect, tense, or mood morphology, the morphemes higher in the clausal spine are expressed outside of the syntactic verb-word. Put differently, I show that there is a ‘cut-off’ point after viewpoint aspect, in that features below this head in the hierarchical structure can combine inside a single syntactic unit, but features above cannot.

I provide an analysis in Sec. 2.3. Crucially the result will be that there are various ways a unit can be built as a word. First of all, a distinction can be made between syntactic and phonological words, where I propose that syntactic words are delimited by phase heads. Phonological words could be bigger, even though the pitch accent in (5) follows the pattern where there is a syntactic word boundary at the edge of the aspectual morpheme, the tense marker still is hosted by the main verb and forms a bigger phonological unit. Thus I propose that there is a uni-directional mapping from syntax to phonology, but not vice versa. The creation of bigger phonological units including the main verb, aspect and tense, I argue, takes place after vocabulary insertion of the main verb.

Second, I show that the type of morpheme matters as well in how words are built: i.e., I show how it is possible to account for the differences between (4) and (6) by assuming that the causative marker is a functional morpheme that is a host, whereas *hajime* is not.

Thus, the result of this investigation will be that Japanese and Turkish are agglutinating in a very superficial way, not syntactically, and are in many respects similar to Dutch and English. Even though there seems to be variation in what constitutes a phonological word, but there is in fact considerable regularity in the syntax between languages. This regularity might be masked in certain contexts, namely in the phonology or because certain morphemes have a different status. The proposal presented in this chapter will then be explored in more detail in the following chapters with regard to head movement (Chapter 3), phases (Chapter 4) and cross-linguistic distribution of TMA material (Chapter 5).

2.1 Sorting out [V - X₁ - X₂] : one or more units?

The first step in order to show variation in periphrasis and synthetic alternations, is to investigate in more detail restrictions on word-hood in languages that seems to have much less periphrastic constructions than a language like English. The aim is to show that the examples in (7-8) are not simple affixation examples, but that it matters which features need to be expressed, and if the features are expressed as bound morphemes or not.² Specifically, I show that (7a) and (8) consist underlyingly of two syntactic units. I also show that (7b) has a different set of morphemes, where the aspectual marker is not a bound morpheme, and has different syntactic and phonological behaviour.

- (7) a. hedatar -te -ru
 be.distant -PROG -PRS
 ‘It is being (becoming) distant / It is distant’ [Japanese]
- b. hedatar -i -hajime -ru
 be.distant -INF -ASP.BEGIN -PRS
 ‘It begins to become distant’

²All data, unless otherwise noted come from consulting A. Arano, Y. Fujiwara, Y. Noguchi, T. Mizuno, H. Oda and Y. Tatsumi for Japanese, and G. Güneş and H. Sevgi for Turkish.

- (8) gel- miş -ti-m
 come -PRF -PST-1.SG
 ‘I had come’ [Turkish]

In order to determine this, it is important to look at both the phonology and the syntax. Simply determining that there are two groupings in phonology can still mean that in the syntax there is only a single unit. Thus, only when there are phonological and syntactic phenomena that pick out the same unit, is there evidence that a [V -X₁ -X₂] consists underlyingly of two units. If there is no such evidence I will conclude for now that we are dealing with a single word in all levels of grammar. This section is split up in a section for Japanese, and then for Turkish. For both a section is dedicated to the phonology and one to the syntax. In Turkish, there is a difference between synthetic verb forms in that they have a single domain for stress assignment and vowel harmony, and periphrastic forms where there are two domains. However, there are various cases where the stress and vowel harmony domain do not match up, which is a first indication for there being two words underlyingly. Using tests like coordination and intervening elements, it is possible to show that the phonological mismatched verbs pattern with periphrastic forms and not with synthetic ones. The same rationale is used for Japanese. However, in this language there seems to be a three way distinction, because there exist a certain class of ASP -T combinations that behave in between synthetic and periphrastic forms. It turns out that this group of verbs has morphemes that are more freestanding, and pattern with restructuring verbs.

2.1.1 Phonology and words in Japanese

Japanese has been described as a language where there is a big verb-word which can consist of multiple affixes, i.e. as a textbook example of an agglutinating language (McCawley 1968, Inoue 1969, Sugioka 1984, Sawada 2007, a.o). An example of this is given in (9).

- (9) hatarak -ase -rare -tagar -i -sugi -ru [Japanese]
 work -CAUS -PASS -WANT -EPENTH -EXCEED -PRS
 ‘Want too much to be forced to work’ (Sugioka 1984)

For Japanese, I show there are two types of constructions that do not involve only affixation,

and as such do not form synthetic verb forms. For (10) I show that there are two syntactic words, based on various constituency tests such as coordination and movement: the verb plus the aspectual marker behaves as a single unit, separately from the tense marker. This aligns with the pitch accent pattern, where the tense marker is not part of the pitch accent contour. However, the auxiliary /i/ does not have to be present, which makes it seem like there is a single word, and the auxiliary is sensitive to the last accent of the pitch contour of the verb. The second type of construction that will be discussed is shown in (11). In this case there is a single phonological domain for pitch accent, and the contour ends on the last morpheme (tense). However, I show that both morphologically and syntactically these verbs do not behave as synthetic verb forms. I provide evidence that this is because the aspectual marker is not a bound morpheme, but more similar to a free morpheme. This also aligns with these morphemes being classified as restructuring predicates.

- (10) a. ((L H H L) L L)
 he. da. ta. te. i ru
 b. [hedatar -te] [(i) ru]
 be.distant -ASP (AUX) PRS
 ‘It is being (becoming) distant / It is distant ’

- (11) a. (L H H H H H H L)
 he. da. ta. ri. ha. ji. me. ru.
 [[hedatar -i] -hajime -ru]
 be.distant -INF -ASP.BEGIN -PRS
 ‘It begins to become distant’ [Japanese]

2.1.1.1 Words in phonology

For Japanese, the relevant phonological test comes from pitch accent patterns. Generally, in underived words there is a single pitch accent pattern. When looking at verbs, it is important to distinguish two verb classes (Kubozono 2011, Kawahara 2015, Yamada 2019): unaccented, (12), and accented verbs (13). The pitch pattern consists of low (L) and high (H) pitches. Both types have an initial L pitch, but they differ in having an additional L pitch at the end of the verb. Accented refers to the fact there is a L pitch at the end of the word, unaccented means that after the initial L,

there is no final L. The notation for the examples is as follows: The (a.) example always provides the pitch pattern and the second line to the syllabic structure; the (b.) examples give the morphological breakdown.

(12) Unaccented

- a. (L H H H H H)
me. si. a. ga. ru.
b. [mesiagar -ru]
eat.HON PRS
'(It) eats'

(13) Accented

- a. (L H H H L)
a. ra. ta. me. ru.
b. [aratamer -ru]
renew -PRS
'(I) renew (something)'

This distinction is a lexical one, i.e., the verb stem determines if the whole verb-word will be an accented or not. This difference is important to understand with regard to size of words in this chapter, which is why I provide some more explanation on the underlying representations. In order to account for this difference, I follow McCawley (1968, 1977), Kubozono (2011), Kawahara (2015), a. o., in that accented verb roots have a diacritic that states that the right edge of a word boundary needs to be assigned a low pitch, (14). Unaccented verbs are not listed with any such diacritics.

$$(14) \quad \emptyset \rightarrow L / (v^x \dots \sigma) \# \quad \text{[Accented verbs]}$$

The first syllable is in most cases low as well, and all remaining syllables will get a high pitch, this is summarized in (15). These are regular pitch accent rules for verbs in Japanese, and are the same for accented and unaccented lexical verbs (Martin 1952, McCawley 1968, 1977, Poser 1984, Kubozono 1988, Pierrehumbert and Beckman 1988, Ito and Mester 2009). I assume that these rules apply when a phonological word is built. I discuss below how a phonological word is built.

$$(15) \quad \begin{array}{ll} \text{a. } \emptyset \rightarrow L / \#(\sigma \dots & \text{[Pitch first syllable]} \\ \text{b. } \emptyset \rightarrow H & \text{[Pitch remaining syllables]} \end{array}$$

A sample derivation of pitch-accent assignment for (12-13) is given in (16-18). The first step is assigning lexical specifications, in this case (14) for the accented verbs, (16). The second step is

assigning low pitch to the first element, (17). Finally, the remaining syllables receive high pitch, (18). On the left (a.) the unaccented form is given, and on the right (b.) the accented form is presented.

- | | | | | | | |
|------|----|----------------------|----|----------------------|-------------|--------------|
| (16) | a. | | b. | L | [Rule (14)] | |
| | | me. si. a. ga. ru.) | | a. ma. ta. me. ru.) | | |
| (17) | a. | L | b. | L | L | [Rule (15a)] |
| | | me. si. a. ga. ru.) | | a. ma. ta. me. ru.) | | |
| (18) | a. | L | H | H | H | |
| | | me. si. a. ga. ru.) | | a. ma. ta. me. ru.) | | [Rule (15b)] |

This means that pitch assignment is uniform for different lexical verb classes, but the difference comes from a lexical specification on specific verbs. This is not dependent on the phonological make-up of the verb, nor of the number of syllables the verb has. The distinction between accented and unaccented verbs holds for verb stems consisting of four, (12-13), three, (19-20), two, (21-22) syllables . For every of the examples, the left example exemplifies the non-accented verbs, the examples on the right are the accented verbs.

- | | | | | | |
|------|----|-----------------------------|------|----|-----------------------|
| (19) | a. | (L H H H) | (20) | a. | (L H H L) |
| | | na. ku. na. ru. | | | he. da. ta. ru |
| | b. | [nakunar -ru] | | b. | [hedatar -ru] |
| | | pass.away -PRS | | | be.distant -PRS |
| | | ‘It dissapears’ | | | ‘(it) is distant’ |
| (21) | a. | (L H H) | (22) | a. | (L H L) |
| | | ha. re. ru. | | | ha. re. ru |
| | b. | [hare -ru] | | b. | [hare -ru] |
| | | become.swollen -PRS | | | clear.up -PRS |
| | | ‘that (it) becomes swollen’ | | | ‘That (it) clears up’ |

The difference between accented and unaccented verbs is even visible in verb stems that only consist of single syllables, (23-24), but the pattern is slightly different (Yamada 2019). For the

unaccented single syllable verbs nothing special needs to be said: both rules in (15) apply, and the first syllable is L, and the remaining ones are high, (23). However, the accented single syllable verb stems have a slightly different pattern: in this case the first syllable receives H and not L.

- | | | | |
|------|--|------|---|
| (23) | a. (L H)
na. ru.
b. [na -ru]
ring -PRS
'That (it) rings' | (24) | a. (H L)
na. ru.
b. [na. ru]
become PRS
'That (it) becomes' (Yamada 2019) |
|------|--|------|---|

Following Kubozono (2011), Kawahara (2015), a.o., I assume that it is not possible for content words to only consist of low pitch. The lexical pitch-assignment rule applies first, giving the last syllable low pitch. Since there is only one other syllable, the rule assigning low pitch to the first syllable (15a), is blocked. This pattern of the first syllable being H disappears as soon as there are more syllables, which come from other suffixes that are part of the same phonological word.

With this in mind, we can now turn to the variation with different suffixes, to see which morphemes participate in pitch accent assignment and which ones do not. As mentioned in the introduction, not all morphemes are always part of the pitch accent contour. That is, not all morphemes are always mapped onto a phonological word in which the pitch accent is assigned. Even though some morphemes always are part of the contour (voice elements), and some morphemes always fall outside of the contour of the verb (C elements), other morphemes are part of the contour or not, depending on the context (T elements). Thus, it is not possible to always identify the edge of a phonological word based on a specific morpheme, but it depends on a specific combination of morphemes (in case of tense and aspect.). That is, tense and aspect by themselves can participate in pitch accent, but in combination of both aspect and tense there is a break similar to the C elements. The affixation has been tested for different verbs from the accented and unaccented verb classes. However, it is not possible to keep the verb stem the same throughout all of the examples, because there might be independent (semantic or argument structure) reasons why certain verb stems and morphemes cannot combine.

First, voice elements are considered. For both the causative (25-26) and the passive, (27-28) the

pitch accent domain includes these morphemes. Thus, when a causative or passive morpheme is attached in between the tense morpheme and the verb stem, all the morphemes are part of the pitch contour, both in accented and unaccented verbs.

(25) Causative, unaccented

- a. (L H H H H)
ok. u. ra. se. ru
- b. [oku -sase -ru]
send -CAUS -PRS
'It gets sent'

(26) Causative, accented

- a. (L H H H H L)
he. da. ta. ra. se. ru
- b. [hedatar -sase -ru]
be.distant -CAUS -PRS
'To make it distant'

(27) Passive, unaccented

- a. (L H H H H H)
me. si. a. ga. ra. re. ru
- b. [mesiagar -rare -ru]
eat.HON -PASS -PRS
'It is eaten (by him)'

(28) Passive, present, accented

- a. (L H H H H L)
he. da. ta. ra. re. ru
- b. [hedatar -rare -ru]
be.distant -PASS -PRS
'It is adversatively distant'

The verb is still treated as a single phonological word with multiple morphemes that occur below tense, such as multiple voice and modality markers, (29).

- (29) a. (L H H H H H H H H L)
ha. ta. ra. ka. se. ra. re. ta. ga. ru.
- b. [hatarak -ase -rare -taga -ru]
work -CAUS -PASS -WANT -PRS
'Want to be forced to work'

When the examples above are put in the past tense, the pattern is quite similar. Below an example is given for a single past marker for an unaccented and accented form. Just as with the present tense, the amount of syllables do not alter this pattern.³

³There is some variety: there seems to be speaker variation, and there is variation in which morpheme combinations trigger a difference. That is, for some speakers in simple tenses, but for most when the past tense when it is attached to a causative or passive marker, the pitch contour does not end on the past tense in accented verbs, but on the syllable before this, (1-2).

(30) Past, unaccented

- a. (L H H H H)
me. si. a. ga. tta
- b. [mesiagar -ta]
eat.HON -PST
'It became eaten'

(31) Past, accented

- a. (L H H L)
he. da. ta. tta
- b. [hedata -ta]
be.distant -PST
'It was distant'

Thus, at this point there is nothing unexpected happening: more suffixes means the pitch accent domain spreads. This is different for elements in the C domain, (Yamada 2019). The C elements are glossed as sentence final particles, but they contribute to the speech act of the clause and are not easily translatable. For both the accented and the unaccented verbs the domain on which the pitch spreads is the same as without the C elements. This contrasts with the morphemes that are added below the tense marker, that do contribute to spreading the pitch accent of the verb stem.

(32) Sentence final particles, unaccented

- a. (L H H H) L L
na. ku. na. ru. yo. ne.
- b. [nakunar -ru] yo ne
renew -PRS SFP -SFP

(33) Sentence final particles, accented

- a. (L H H H L) L L
a. ra. ta. me. ru. yo. ne.
- b. [aratamer -ru] yo ne
renew -PRS SFP SFP

This means that, in terms of word-boundaries, these speech-act particles are not part of a word the same way that voice or tense morphemes are: they are never part of the phonological word, like

(1) Past, causative accented

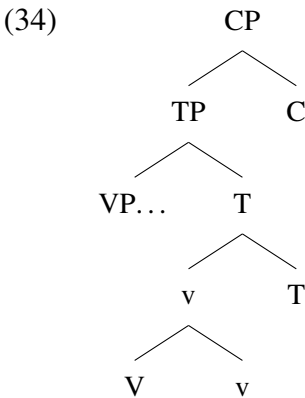
- a. (L H H H L L)
he. da. ta. ra. se. ta
- b. [hedata -sase -ta]
be.distant -CAUS -PST
'To made it distant'

(2) Past, unaccented

- a. (L H L L)
he. da. ta. ta
- b. [hedata -ta]
be.distant -PST
'It became distant'

There is discussion in the literature if this is a phonological effect or not (Yamaguchi 2010, Nishiyama 2010, Oshima 2014, a.o.), due to the form of these morphemes or not. Nishiyama 2010 argues that *ta* needs to be specified as extrametrical. A different approach is taken by Yamada (2019), who argues that there is a morphological distinction between the present tense marker being a *v* head, and past being in T. Crucially, past in T and undergo Local dislocation (Embick and Noyer 2001, Shwayder 2015), where the past tense moves on the verb after vocabulary insertion of the main verb. This would predict that the tense head remains separate in the syntax. However, in the following section I show that there does not seem to be any evidence that *ta* and *ru* are syntactically different. Thus, for now I follow Nishiyama (2010) in that the past marker is extrametrical. Even though this is not represented in (31), there is speaker variation here too.

tense or voice morphemes can be. There are roughly two options to account for this pattern: in the phonology or in the syntax. In the phonology there can be a rule that puts diacritics on several markers that they are never part of the pitch contour of the verb. This makes the prediction that in the syntax these elements can be separate from the verb, but do not have to be. An other option, which is what I will argue for in this dissertation, is that syntactic grouping is mapped onto the phonology. If something is a syntactic complex head, it will be mapped onto a phonological word. If this analysis on the right track, there should be syntactic evidence that C remains independent from the verb. Evidence for this will be provided in the next section. Then, in Sec. 2.3, and Sec. 3 I provide an analysis that the heads that can be mapped into a syntactic unit are constrained by syntactic domains. This syntactic analysis can be represented as follows, (34), where tense and the verb stem end up in a single syntactic word, but speech-act particles do not; those can remain independent. The boundary after T is also the boundary where pitch accent assignment takes place, and cannot pass this boundary.



A boundary for the pitch accent contour is present with tense-aspect combinations, where not all morphemes are part of the contour. This is different from the C elements above, in that Tense can be part of the contour, as shown for simple tenses and voice marking. However, when there is a progressive marker, the tense morpheme is not part of the pitch contour, in accented verbs (36): The pitch extends until aspect, and all remaining syllables will remain low. In unaccented verbs the tense morpheme is part of the pitch contour, (35). In some literature */teiru/* is represented as a single word together with the verb stem; whereas in others it is represented as two separate words,

where /te/ is part of the verb stem and /iru/ is an auxiliary hosting tense information. The latter view, where it is an auxiliary, fits for the accented verbs: pitch accent ends on the aspect marker and the remaining syllables remain low. However, for the unaccented pattern, there is a difference from the C elements: in this case the pitch spreads. Thus, phonologically the aspect, /i/ and tense morpheme seem to end up in a single word.

(35) asp, present, unaccented

- a. (L H H H H H)
me. si. a. ga. te. i. ru
- b. [mesiagar -te] [i -ru]
eat.HON -PROG AUX -PRS
'It is being eaten / It is eaten '

(36) asp, present, accented

- a. ((L H H L) L L)
he. da. ta. te. i. ru
- b. [hedatar te] [i -ru]
be.distant -ASP AUX -PRS
'It is being distant '

It is also possible to pronounce these morpheme combinations without /i/, (37-38). In this case the pitch accent pattern remains the same, in the unaccented verbs the tense marker is high, and in the accented verb it is low. Thus, without the /i/, even when it is analyzed as an auxiliary, the pattern morphologically looks completely agglutinating. However, the pitch accent pattern, specifically in the accented verbs remains one where the tense marker is outside of the pitch accent domain. Thus, the morphological representation is now given as if it completely matches the phonological word domain. Below it will be shown that the morphological (and syntactic) domain is different.

(37) asp, present, unaccented

- a. (L H H H H H)
me. si. a. ga. te. ru
- b. [mesiagar -te -ru]
eat.HON -PROG -PRS
'It is being eaten / It is eaten '

(38) asp, present, accented

- a. (L H H L) L
he. da. ta. te. ru
- b. [hedatar te] -ru
be.distant -ASP -PRS
'It is being distant '

Right now, there is a mismatch: aspect-tense combinations in the phonology are not uniformly a single word, nor are they uniformly two separate words. However, the only instance where this plays a role is in the context of a combination of tense and aspect. This does not play a role with C elements, as discussed above: in those cases the accented and unaccented verbs behave the

same in that both pitch accent patterns stop before the C elements. I assume that *iru*, differently from speech-act particles, is not specified for its own pitch accent, but rather the pitch of the last syllable from the main verb spreads to *iru*. This means that there is always a word boundary in both accented and unaccented verb forms after tense (with speech-act particles), or after aspect (with tense). Speech-act morphemes carry their own low pitch, and also do not need to be hosted by other material, such as an auxiliary. Tense morphemes, on the other hand, need to attach to an auxiliary. I assume that auxiliaries of this sort do not carry their own pitch accent (Selkirk 1995). This proposal implies that the ‘spreading’ of high pitch in (35-37) is derived in the phonology and predicts that */iru/* should behave as an independent word, and should be able to alternate in the pitch it carries. First I show that the pitch can alternate, and in the next section I provide additional evidence that */iru/* is indeed a separate syntactic word. Next I show how this alternation can be derived in the phonology, by also comparing it to C elements.

For showing that the pitch for */iru/* is not set, it is important to see what happens when this element is not next to the main verb. For example, a speech act particle with low pitch, or the word */bakaril/*, ‘only’ can occur in between the main verb and */iru/*, (39-40). When this happens, */iru/* has low pitch. Specifically, this is the case with unaccented verbs, where this element would receive high pitch when nothing intervenes between the main verb and the auxiliary; compare the examples below with (35).

- | | | | | | |
|------|----|----------------------------------|------|----|---------------------------------------|
| (39) | a. | (L H H H H) (L) L L | (40) | a. | (L H H H H) (H L L) L L |
| | | me. si. a. ga. te. no. i. ru. | | | me. si. a. ga. te. ba. ka. ri. i. ru. |
| | b. | [mesiaga -te] [no] [i -ru] | | b. | [mesiaga -te] [bakaril] [i -ru] |
| | | eat.HON -ASP SA AUX -PRS | | | eat.HON -ASP only AUX -PRS |

These data point towards *iru* not being specified for pitch accent, but it takes over the pitch from the previous element. This means that it looks like there is a single domain when it occurs adjacent to an unaccented verb. The data in (39-40) are already a first indication that even in unaccented verbs there are multiple words present, because several markers can occur in between. In the next section I use similar tests with other morphemes, to show that there is indeed a contrast with morphemes

that are real affixes, and those that are not.

It means that we now end up with both speech act particles and *irul* being independent from the main verb, and the pitch accent domain. The difference comes from the (under)specification with regard to pitch accent. Basically, the main verbs in all cases with speech act elements and with *irul* are derived in the same way as was presented above, according to the rules in (14-15). In accented verbs, a low pitch is assigned to the last syllable of the word, and this does not happen in unaccented verbs. In case of a speech act particle, the boundary for pitch accent of the main verb is always visible, because these elements always carry low pitch. In case of the auxiliary, the pitch of the preceding element is taken over. This means that the auxiliary can clitize onto the preceding element, forming a larger phonological domain.

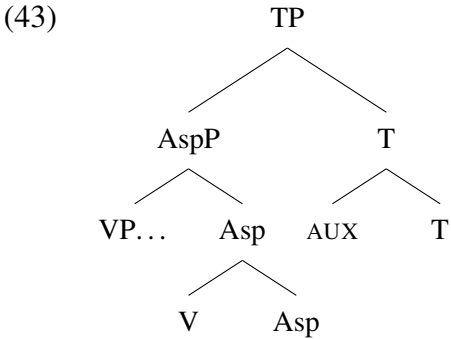
(41) a. (L H H H H)
me si a ga te i ru

b. ((L H H H H) H H)
me si a ga te i ru

(42) a. (L H H L)
he da ta te i ru

b. ((L H H L) L L)
he da ta te i ru

The structure of aspect-tense combinations is one where there are two syntactic units. In the phonology, however, there is a different structure: there is a smaller phonological unit, in which the pitch contour is assigned, and this is the domain that matches with the syntactic word. The bigger phonological word includes the auxiliary, in which the pitch from the last element of the contour spreads. This is to some extent similar and different to C-elements, in that both C and T are in separate syntactic words from the verb. The difference is that C elements always remain outside of the pitch contour domain, and are also never part of a syntactic word with the verb. Tense on the other hand needs to be hosted by another morpheme, and in case it is separate from the main verb it is hosted by an auxiliary, (43). In the next section I focus in more detail on how we end up with one or multiple syntactic words, this is only to show the abstract representation that feeds into phonology.



The construction with *te* for progressive marking is not the only type of aspect Japanese has. There are various other types of aspectual markers that do not require the *i* auxiliary between tense and aspect. These markers seem to show up as suffixes, but are called ‘aspectual verbs’, ‘syntactic V-V compounds’ (Kageyama 1982, 1993, 2016, a.o.), or ‘restructuring verbs’ (Fukushima 1999, Wurmbrand 2001, Bobaljik and Wurmbrand 2007, Fukuda 2012). Some examples are given in (44-46), for accented verbs. As can be seen, for pitch accent all elements are treated as a single phonological word.

- (44) a. (L H H H H H H L)
 he. da. ta. ri. ha. ji. me. ru.
 b. [[hedatar -i] -hajime -ru]
 get.distant -INF -begin -PRS
 ‘begin to become distant’
- (45) a. (L H H H H H H L)
 he. da. ta. ri. tsu. zu. ki. ru.
 b. [[hedatar -i] -tsuzuki -ru]
 get.distant -INF -continue -PRS
 ‘continue to become distant’
- (46) a. (L H H H H H L)
 he. da. ta. ri. o. e. ru.
 b. [[hedatar -i] -oe -ru]
 get.distant -INF -finish -PRS
 ‘finish to become distant’

The restructuring verbs are similar with regard to their pitch contour to the voice morphemes in that the contour ends on the tense marker. This is then different from the accented verbs with tense and aspect above, (36), where the pitch contour ends on the aspectual marker, and does not

extend past it. However, the morphological make up of the verbs in (44-46) is different from the verbs discussed in 36). In case of /te/, the tense morpheme is optionally hosted by an auxiliary element, and this auxiliary is not grammatical with the aspectual morphemes in (44-46). Second, in case of /te/, the morpheme is directly attached to the verb stem, whereas this is not the case with the aspectual verbs. In this case there is an additional morpheme, an infinitival marker. This morpheme indicates that the aspectual markers are more independent from the verb stem than other morphemes, such as the progressive, passive, or causative is where the form of the verb stem and the phonological form of the morpheme is sensitive to phonological restrictions. However, if the verb stem and the aspectual markers are more independent, it is surprising that they form a single unit for pitch accent and that this pitch accent is the same as verbs with a causative marker, but is different from the other aspect-tense combinations discussed above.

I assume that these aspectual markers are roots rather than bound morphemes that need a host.⁴ That is, the difference between an element like tense or the progressive and these aspectual markers is what these morphemes are: roots or not. This means that in examples (44-46) there are in fact two roots: the main verb and the aspectual morpheme. This is in line with the fact that these aspectual markers are restructuring verbs as well (Shibatani 1973, 1978, Kuno 1987, Kageyama 1993, 1999, Nishigauchi 1993, Koizumi 1995, Matsumoto 1996, Fukuda 2012).⁵ I assume that, similarly to the synthetic verb forms, these verbs containing two roots are also combined into a single head. The difference is that in this case there is an infinitival marker on the verb-root. I assume that this is because the verb needs to have at least one affix attached to it, and the aspectual root marker is not an affix (compare to Sawada (2007) for the difference between selection and needing an affix). Thus,

⁴For simplicity I refer to these morphemes elements as roots, since they share properties with lexical roots in that they can stand on their own and can contribute meaning. These elements are, however, not necessarily the same, since ‘roots’ inserted in the extended projection of a lexical element tend to be a closed class, and are not, like most lexical elements an open class. They could also be called ‘semi-lexical elements’ (see articles in the edited volume by Corver and van Riemsdijk (2001), and Pots (2020)). The exact status is not crucial here, but what is important is that they are elements that are more free in their distribution, and different from, bound morphemes.

⁵Analyzing these verbs as containing two roots is an oversimplification of complementation structures, such as restructuring. I do not take a particular view on restructuring here, even though I represent the elements in this thesis as if they are inserted in the extended projection of a verb stem. This is done to focus on the type of morpheme that is used, and the consequences the status of this morpheme has on the syntactic and phonological behaviour. It could well be the case that these configurations involve VP-complementation structures.

these verbs form a syntactic word in the same way that synthetic verb forms do, but the difference is the fact that there are two roots in the bigger complex head, (47).

$$(47) \quad [[[[\sqrt{root}] v] \sqrt{asp}] T]_{x^0}$$

Thus, at this point the only difference between a synthetic verb form and verbs with aspectual root morphemes is the status of the morphemes. Both roots and functional morphemes can form a single syntactic and phonological word with a single pitch accent contour. What remains open at this point are two issues: if some markers are roots and others are functional morphemes needing a host, it is expected that there are also syntactic differences. This will be explored in the next section, 2.1.1.2. Second, the question remains what is responsible for the syntactic difference where the progressive marker counts at the edge of a phonological and syntactic word, whereas aspectual markers in (44-46) do not. This question will be taken up in Sec. 2.2.1.

To summarize, Pitch contour can be used to find (at least) phonological word boundaries. An overview is given in table 2.1 for different feature combinations. Each of the representations is a two-syllable verb stem (L H) including one or more morphemes. In case of simple tenses, causative-tense combinations and *hajime*-type verbs there is always a single phonological unit. This does not change for accented and unaccented verbs. This is in contrast with C elements, where the pitch carried by this morpheme is not part of the pitch accent domain of the main verb. For now, it seems like there is a mismatch for different aspectual markers in combination with tense. Only in case of the accented verbs with /te/ and tense there is a boundary that is similar to C elements. However, I have given some preliminary evidence that this is phonological rather than syntactic. The syntactic predictions are tested in the next section. Finally, even though phonologically *hajime*-verbs form a single unit, they differ in their morphological make-up from other single units, such as verbs with a voice element. Again, the difference in morphology and syntax is explored in the next section.

	V-T	V-CAUS-T	V-PROG-T	V-T-C	V-hajime-T
unaccented	(L H H)	(L H H H H)	((L H H) H H)	(L H H)(L)	(L H H H H H H)
accented	(L H L)	(L H H H L)	((L H L) L L)	(L H L)(L)	(L H H H H H L)

Table 2.1: Overview word-hood tests in Japanese, version 1

2.1.1.2 Syntax and words in Japanese

As mentioned before, I assume that phonology picks out units that resemble syntactic units. The question is if the mismatches that were found are true syntax-phonology mismatches, or if they come from different syntactic structures. There are several tests that are available to determine syntactic word-hood, namely coordination, and intervening elements. For these tests a marker like the causative (but the same holds for other voice elements) counts as a single word; Both the non-accented and the accented verbs with *te iru* behave syntactically like two words, indicating that the unaccented forms are only phonologically a single unit. Finally, elements like *hajime* behave for coordination as two words with the main verb, but for intervening elements and pitch accent as a single unit. There is only a phonological difference in case of the unaccented verbs. For the aspectual *hajime* markers I show that they are for the phonological tests and for one syntactic test treated as a single unit, but for another syntactic test they are treated as two syntactic words. Despite this picture, it is argued in the following sections that this follows if *hajime* is taken as a root rather than a morpheme that needs a host. It forms a single syntactic word that is mapped onto a single phonological word, but since the whole syntactic word contains two roots it also shows behaviour of compounds. Moreover, their morphological make-up, including an infinitival marker on the main verb is in line with other properties of compounds, and in line with the morphological make-up of the verbs (Nishiyama 2017).

First, let us turn to the coordination tests. These tests have been used in the literature, and discussed as a type of suspended affixation and used as an argument for how verbs are built in Japanese. (Fukushima 1999, Kuroda 2003, Takano 2004, Nishiyama 2012, a.o.). Even though there are various types of coordination that are possible, and various types of analyses, the focus here is on whether it is possible to have coordination of (i) bare verbs coordinated under a morpheme, or to have (ii) verbs containing various morphemes coordinated under a higher morpheme. As will become clear, there is a difference between synthetic forms (tense, or tense plus causative) which cannot be coordinated, the progressive marker which can be coordinated under the tense auxiliary, and the aspectual *hajime* markers, which allow the most freedom for coordination. Thus, as was

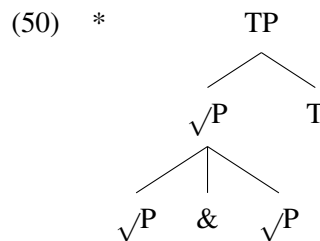
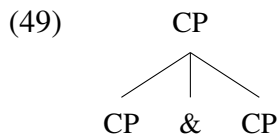
discussed for the phonological tests, there is a difference between the progressive marker combined with the tense auxiliary and the synthetic verb forms. However, the *hajime* markers behave more like the periphrastic construction rather than the synthetic verb forms. This can be explained by the different status of *hajime* as a root rather than a functional morpheme that needs a host.

The following examples involve simple tense forms, (48). The examples show the present tense marker, but the same pattern holds for the past tense marker. The intended reading is the same for all examples and is given at the top of the example. When whole verb forms are conjoined, a preference is given to the sentential conjunction, *si*, and not *katsu*. Conjunction of the bare verb stem under a tense marker is not possible with either form of the conjunction, (48b).⁶

(48) Intended: ‘S/he reads and writes’

- a. i. [kak -**u**] si [yom **u**] [V-T] & [V-T]
 read -PRS & write -PRS
 ii.??[kak -**u**] katsu [yom **u**]
 read -PRS & write -PRS
- b. i. *[kaka] si [yom] **u** [V] & [V]-T
 read & write -PRS
 ii. *[kaka] katsu [yom] **u**
 read & write -PRS

To summarize, I take this to mean the following. It is possible to conjoin phrases, which prefer the phrasal coordinator *si*, (49), but it is not possible to conjoin bare verbs, (50).



⁶The only way the intended reading is possible with one tense marker in the second conjunct is to pronounce the infinitival marker on the first verb form, (1). In this case only the non-sentential marker is grammatical. I assume that these might involve different types of coordinations, also because there are restrictions on how the first verb is interpreted (past versus present). What is crucial here is that it is not possible to conjoin bare verbs.

- (1) a. *[kak -**i**] si [yom] **u** [V-inf] & [V]-T
 read -INF & write -PRS
 b. [kak -**i**] katsu [yom] **u**
 read -INF & write -PRS

As discussed in the section on phonology, the causative and passive morpheme form a single domain for pitch accent with the main verb. The data presented in (51) include the causative morpheme, but the same pattern holds for the passive. It is possible to coordinate two whole verb forms including tense and the causative, (51a). In this case the sentential coordination is preferred (*si*) over the coordinator that is used with phrases (*katsu*). When the verb and the causative marker are coordinated under the tense morpheme, (51b), the sentence is not fully ungrammatical, but it is marked to get the interpretation where both the ‘writing’ and ‘reading’ activity are being causativized. This could be due to the same type of ungrammaticality as discussed above for the simple tenses. Crucially, this is different from the data discussed below with the aspectual markers, where it is completely grammatical to coordinate verbs plus the aspect marker under a tense marker. Finally, it is ungrammatical to coordinate two bare verbs (51c) under the causative marker with the intended reading where someone was made to write and was made to read, nor is it possible to have the infinitival marker present. No other form of the verb is grammatical in this case.

(51) Intended: X makes Y write and makes Y read

- a. i. [kaka **-se** **-ru**] si [yom **-ase** **-ru**] [V-CAUS-T] & [V-CAUS-T]
 write -CAUS -PRS & read -CAUS -PRS
 ii.??[kaka **-se** **-ru**] katsu [yom **-ase** **-ru**]
 write -CAUS -PRS & read -CAUS -PRS
- b. i. *[kaka **-se** si yom **-ase**] **-ru** [V-CAUS] & [V-CAUS]-T
 write -CAUS & read -CAUS -PRS
 ii.??[kaka **-se** katsu yom **-ase**] **-ru**
 write -CAUS & read -CAUS -PRS
- c. i. *[kaka si yom] **-ase** **-ru** [V] & [V]-CAUS-T
 write & read -CAUS -PRS
 ii. *[kaka katsu yom] **-ase** **-ru**
 write & read -CAUS -PRS

A different pattern arises with regard to aspectual affixes. As before, it is possible to have a construction where two verbs plus auxiliaries are coordinated, as in (52a) for the */te/* aspect marker and tense.⁷ In this case the coordinator is the form which is generally used on a sentence level.

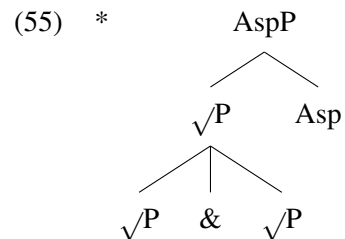
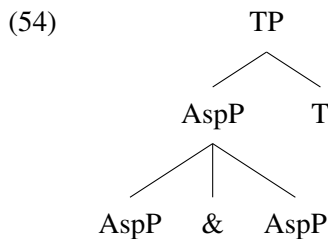
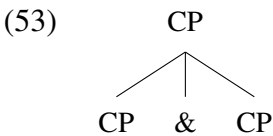
⁷the difference in the form of the aspectual marker is phonological, as there is a voicing assimilation process when the morpheme occurs in front of voiced consonants (Ito and Mester 2015). The same would happen with the past tense marker */ta/*.

The auxiliary in the first conjunct is not present, and the auxiliary in the second conjunct can then scope over both verb+aspect constituents, (52b). Thus, the meaning of the first conjunct is still present tense. Note that in this case a different coordinator is used, and the sentence level form for coordination is not grammatical anymore. It is not possible to drop more information in the first conjunct, (52c): it is not possible to have the verb stems coordinated under the aspectual marker and the present tense. Thus, the domain that is picked out by the pitch accent domain in accented verbs is also the domain that is picked out by coordination.

(52) Intended ‘s/he becomes distant / becomes separated and becomes glad’

- a. [hedata -te] (i) -ru si [yorokun -de] i -ru
 be.distant -PROG AUX -PRS & be.glad -PROG AUX -PRS
- b. [hedata -te katsu yorokun -de]_{asp} i -ru
 be.distant -PROG & be.glad -PROG AUX -PRS
- c. *[hedata katsu yorokun] -de i -ru
 be.distant & be.glad -PROG AUX -PRS

I assume that in these cases different parts of the structure are coordinated. In case of the clausal coordinator where the auxiliaries are coordinated as well, I assume that these are CPs, (53). In case of (52b) I assume that a smaller structure is coordinated, namely AspPs, (54). It is not possible to conjoin VPs, (55). I do not address the question of why it is possible to conjoin AspP but not VP right now, this will be taken up in the next sections and chapters. However, it is important to observe that the same unit that is picked out for word-building is possible for coordination, but units that are sub-words are not possible to be conjoined.



This test can also be used for markers such as *hajime*, (56). In this case, the aspectual morpheme can be absent, (56c), but the infinitival morpheme cannot be, (56d).

(56) Intended: ‘s/he begins to write and begins to read’

- a. [kak -i -hajime -ru] katsu [yom -i -hajime -ru]
 write -INF -begin -PRS & read -INF -begin -PRS
- b. [kak -i -hajime katsu yom -i -hajime] -ru
 write -INF -begin & read -INF -begin -PRS
- c. [kak -i katsu yom -i] -hajime -ru
 write -INF & read -INF -begin -PRS
- d. *[kak katsu yom]-i -hajime -ru
 write & read -INF -begin -PRS

This pattern is different from (52), specifically with regard to example (56c) where the aspect marker can be elided in case of *hajime* but not in case of *te*. However, not that in this case the verb has an infinitival marker. All other examples are in fact similar to the pattern discussed above: it is possible to conjoin CPs, (56a), AspPs, (56b), but not VPs, (56d). This is expected under the analysis where *hajime* is a root rather than a bound morpheme. Moreover, as argued for in the previous section, these are compounds, where the verb and *i* form a single unit from a different extended projection. This is in fact similar to data found in compounding structures, where left-hand members of a compound can be coinjoined (Booij 1985, Weisse 1996, Wurmbrand 1998, a.o.). Thus, *kaki* is exactly the same in that it is the left-hand member of the verbal compound, and the right hand member of the compound can function as a root and stand on itself as well.

This three way distinction in the data above is expected: elements like *hajime* are not affixes, like the causative, but they are also not separate words, as is the case for the verb stem that includes the aspectual marker. The question that remains is if *hajime* and *te* are the same, and should be analyzed with the same underlying structure and the difference coming from the phonology. I argue, based on the distribution of intervening elements, that they are not the same syntactically. The fact that *hajime*-verbs behave like compounds, and are syntactically seen as restructuring verbs can be accounted for if the word building formation is sensitive to different syntactic structures, which might yield different outputs. This is summarized in the table below, which is now expanded with the conjunction facts, together with the phonological facts from the previous section, Tab. 2.2. Just as before, the table consists of different combinations of affixes.

	V-T	V-CAUS-T	V-PROG-T	V-T-C	V-hajime-T
unaccented	(LHH)	(LHHHH)	((LHH)HH)	(LHH)(L)	(LHHHHHH)
accented	(LHL)	(LHHHL)	((LHL)LL)	(LHL)(L)	(LHHHHHL)
conjunction	[\sqrt{V} -T]	[\sqrt{V} -CAUS-T]	[\sqrt{V} -PROG][T]	[\sqrt{V} -T][C]	[[\sqrt{V} -v]- \sqrt{hajime} -T]

Table 2.2: Overview word-hood tests in Japanese, version 2

So far, simple tenses and voice morphemes are consistently a single unit in the phonology and the syntax, and V-PROG-T are consistently two units in the syntax. The *hajime*-morphemes are separated differently in the phonology and the syntax. I have proposed that the morphemes with *hajime*-verbs are roots rather than bound morphemes. This means that in this case there are two roots present in the verb-word, which means that the conjunction patterns are different from synthetic verb forms. Since the aspectual marker is a free element, and forms a compound verb it is more free-standing and can be coordinated. However, I show in the remainder that these *hajime*-markers are not completely freestanding. Rather, they form a compound with the verb stem. That is, they form a complex syntactic head with the verb stem. When discussing the pitch contour assignment, I argued that the pitch contour tracks syntactic word-hood. Thus as such, if a compound verb forms a single complex head, it can behave as a single unit for pitch accent. The fact that this complex head can be separated in case of coordination, is due to the nature of *hajime*.

A different test that distinguishes between affixation, periphrasis and compounding is intervening elements. This can be tested by putting material in between different markers. First of all, the speech act markers, or sentence final particles, can occur in between words (57a), but not inside words, (57b). Crucially for the focus here, it cannot occur between the verb stem and the tense marker, nor between the verb and the causative marker (57c). Put differently, the tense marker and the causative marker always form a syntactic word with the verb stem.

(57) Intended: ‘Chihiro saw No Face’

- a. [Chihiro -ga] {ne} [Kaonashi -o] {ne} [mi -ta] {ne}
 Chihiro -NOM PART No.Face -ACC PART see -PST PART
- b. *[Chihiro -*{ne} -ga] [Kaonashi -*{ne} -o] [mi -*{ne} -ta]
 Chihiro -PART -NOM No.Face -PART -ACC see -PART -PST

- c. * [Chihiro -*{ne} -ga] [Kaonashi -*{ne} -o] [mi -*{ne} -sase -*{ne} -ta]
 Chihiro -PART -NOM No.Face -PART -ACC see -PART -CAUS -PART -PST

However, in a tense aspect combination, there is a split between the different aspectual markers, where the verbs with the *hajime* markers pattern with the simple tenses and voice marking in (57b-57c) and the verbs with *te iru* pattern differently. It is possible to put the particle in between PROG and tense, (58), but not between the verb and *te*, nor between *hajime* and tense, (59), or the verb stem and *hajime*, (59b). Thus, just as above for the pitch accent and the coordination patterns, the verb including *te* seems to behave like an syntactic word in all respects, whereas *hajime* seems to be in between.

(58) Intended: ‘Chihiro was seeing No Face’

- a. Chihiro-ga Kaonashi-o [mi -te] **ne** [i -ta]
 Chihiro-NOM No.Face-ACC see -ASP PART AUX PST
- b. *Chihiro-ga Kaonashi-o [mi **ne** -te] [i -ta]
 Chihiro-NOM No.Face-ACC see PART -ASP AUX PST

(59) Intended: ‘Chihiro begun to see No Face’

- a. *Chihiro-ga Kaonashi-o [mi -hajime **ne** -ta]
 Chihiro-NOM No.Face-ACC see -begin PART PST
- b. *Chihiro-ga Kaonashi-o [mi **ne** -hajime -ta]
 Chihiro-NOM No.Face-ACC see PART -begin PST

That is, the only possibility to put *ne* with all verbal morphology is between the progressive and the auxiliary. I argue that the split between PROG-T combinations versus all other combinations follows from which morphemes form a syntactic word: in case of the PROG-aspect, there are in fact two syntactic words, whereas in all other cases there is only a single syntactic word. Even though *hajime* is a root and thus forms a compound-like structure and as such can participate in coordination, but it cannot be moved around.

The contrast stays the same when larger material other than particles is put in between. The example in (60) is from a famous Japanese children song, and in this case it is possible to put *only* in between the verb and the auxiliary, (60). Replicating this with *only* in between the verb and the aspect marker, voice marking, a simple tense marker, or *hajime* all yield ungrammatical results, (60a-60d).

- (60) [nai -te] **bakari** [i -ru] (koneko-chan)
 cry -PROG only AUX -PRS cat-DIM
 ‘She could only cry, the little kitty’ (from *Inu no omawarisan*, ‘doggy policeman’)
- a. *[nai] **bakari** [-te] [i ru]
 cry only PROG AUX -PRS
- b. *[nai] **bakari** [-se -ru]
 cry only CAUS -PRS
- c. *[nai] **bakari** [-ru]
 cry only -PRS
- d. *[nai] **bakari** [hajime -ru]
 cry only begin -PRS

There is even a contrast with larger material, such as a subject.⁸ Even though the sentence for *ita* is degraded, it is not completely ungrammatical, (61), which is the case for *hajime*, (61b).

- (61) Aogaeru-o [tabe -te]-sae **Kaonashi-ga** [i -ta]
 aogaeru-ACC eat -ASP -even no.face-NOM AUX PST
 ‘No Face was eating Aogaeru’
- a. *Aogaeru-o [tabe]-sae **Kaonashi-ga** [-ta]
 aogaeru-ACC eat -even no.face-NOM -PST
 ‘No Face ate Aogaeru’
- b. *Aogaeru-o [tabe -i]-sae **kaonashi-ga** [hajime -ru]
 aogaeru-ACC eat -INF -even no.face-NOM [begin PRS]

These facts point toward the following: simple tenses and voice elements, and *hajime*-morphemes must form a syntactic unit in the syntax and cannot be separated. The progressive together with tense marking are two separate syntactic words. However, not all elements that form a syntactic unit in the syntax are of the same type: there is a difference between *hajime*-markers and voice and tenses, as was shown for the conjunction tests. These facts are not surprising if aspectual morphemes like *hajime* are in fact roots rather than bound morphemes that need a host. Crucially, a syntactic word can be built with two roots, in which case it behaves like a compound, or with a single root and bound morphemes, and it is possible to build two syntactic words, as is the case for the auxiliary and PROG-morpheme. Moreover, the verbs with the aspectual roots also occur in

⁸The examples are from a scene in *Spirited Away*, where No Face takes over the personality of characters he has eaten. At the end of the movie No Face lets out everything he has eaten, including Aogaeru, and they all live happily (ever after).’

different syntactic environments, namely restructuring contexts. If these in fact occur in different syntactic contexts, it is no surprise that their phonological behavior with regard to pitch accent is different from other auxiliary patterns. All the various constructions discussed so far are given in table 2.3.

	V-T	V-CAUS-T	V-PROG-T	V-T-C	V-hajime-T
unaccented	(L H H)	(L H H H H)	((L H H) H H)	(L H H)(L)	(L H H H H H H)
accented	(L H L)	(L H H H L)	((L H L) L L)	(L H L)(L)	(L H H H H H L)
conjunction	$[\sqrt{V} -T]$	$[\sqrt{V} -CAUS -T]$	$[\sqrt{V} -PROG] [T]$	$[\sqrt{V} -T] [C]$	$[[\sqrt{V} -v] -\sqrt{hajime} -T]$
intervene	$[\sqrt{V} -T]$	$[\sqrt{V} -CAUS -T]$	$[\sqrt{V} -PROG] [T]$	$[\sqrt{V} -T] [C]$	$[\sqrt{V} -v -\sqrt{hajime} -T]$

Table 2.3: Overview word-hood tests in Japanese

To conclude, there are various mismatches with regard to the phonology and the patterning of syntactic tests, but these mismatches follow from differing building blocks, and how these blocks are put together: Lexical aspect morphology, like *hajime* form roots rather than bound morphemes, whereas all other morphology are not roots in the extended projection of the verb. With regard to the latter type of building block, it is not possible to put the PROG and the tense morpheme inside a single syntactic head.

2.1.2 Turkish

Just as Japanese, Turkish has been described as an agglutinating language, and an example is given in (62) where orthographically there is a single verb stem with multiple suffixes.

- (62) ver -il -ebil -ir -di [Turkish]
 give -PASS -ABIL -HAB -PST
 ‘it could be given to him/her’

However, as will become clear, these ‘words’ are not a single syntactic unit, nor a single phonological unit for every phonological process. For Turkish, the relevant phenomena to look at in the phonology are vowel harmony and stress-assignment, and for the syntax it is coordination and intervening elements. As it turns out, stress assignment picks out the same unit as the units that are picked out for coordination and intervening elements. This is familiar from what was discussed for

Japanese in the previous section. Vowel harmony, on the other hand, does not reference syntactic grouping and is only concerned with phonology. Just as for Japanese, I first discuss the relevant phonological properties, and then move on to the syntactic tests.

2.1.2.1 Phonology and words in Turkish

The important phonological processes for word-hood tests discussed here are stress and vowel harmony. As is discussed, in most cases, both align for the same domain, but there are cases where a different unit is picked out for stress than for vowel harmony. This will be useful for the discussion on syntactic word-hood tests in the next chapter where it will be shown that only one of these phonological processes aligns with the syntactic unit.

First let us look at the phonological patterns. Generally, stress is assigned to the last syllable of what is called a word, and it does not matter how many suffixes are attached, nor what the weight of these suffixes is (Lees 1961, Lewis 1967, Sezer 1983). In (63) this is shown (examples from Kabak and Vogel 2001, p.316).

- | | | |
|------|------------------------|----------------------|
| (63) | a. kit'ap | 'book' |
| | b. kitapl'ık | 'bookcase' |
| | c. kitablık'l'ar | 'bookcases' |
| | d. kitablıklar'ım | 'my bookcases' |
| | e. kitablıklarım'ız | 'our bookcases' |
| | f. kitablıklarımızd'an | 'from our bookcases' |

Thus, stress is an indicator of a single phonological unit. Informally, I assume the following stress-assignment rule (based on Kabak and Vogel 2001, Güneş 2009). What will be defined later is the notion of word, i.e., if it is a phonological unit or a morphological one.

- (64) Apply stress to the last syllable of a word

This stress-pattern can be seen in the following verbs, where there is a single TMA (65-70) or voice, (72) morpheme. In most cases the stress falls on the last syllable, (refex:turkish1.⁹). There are,

⁹Data from sources cited and consulting G. Güneş and H. Sevgi.

however some morphemes, like the progressive, that are exceptional in that when this morpheme carries stress, it can fall on the first syllable of that morpheme (van der Hulst and van de Weijer 1991, Kabak and Vogel 2001, a.o.).¹⁰ What will important for the discussion is whether the stress—be it lexically specified for a morpheme or not— shifts when it is preceded or followed by other morphemes that can carry stress. Finally, a note on the notation for vowel harmony. The patterns are presented through arrows under the examples. A dot indicates which vowel is specified, and the arrows indicate which vowel assimilate.

- (65) a. (iç $\xrightarrow{\bullet}$ -'iyor) b. (bitir $\xrightarrow{\bullet}$ -e'cek) [FUT]_{x,0}
 drink -PROG finish -FUT
 's/he is drinking' 's/he will finish' Kornfilt (1997)

- (66) a. (kal $\xrightarrow{\bullet}$ -'dı) b. (kal $\xrightarrow{\bullet}$ -'sa) [COND]_{x,0}
 stay -PST stay -COND
 's/he stayed' 'if s/he stays'

- (67) a. (koş $\xrightarrow{\bullet}$ -'tur) b. (keşf $\xrightarrow{\bullet}$ -ed -'il) [PASS]_{x,0}
 run -CAUS discovery -do -PASS
 'x makes y run' 'x is discovered (by y)'

Crucially, this pattern for stress holds for every suffix if it is the sole suffix on the verb. In other words: every suffix can receive stress, and it is not the case that certain affixes are exceptional in never receiving stress. This is important for the coming discussion, when the focus is on combining affixes to see where the stress falls. It is possible, of course, that a pattern like (63) is expected when TMA affixes are stacked, but this is only the case with certain combinations. When there are multiple suffixes, such as a voice marker and the past tense marker, the stress shifts again to the last syllable in the word, (68a-68b). This means that stress is not necessarily fixed on a particular morpheme: even though the causative or the passive can carry stress (72), they do not have to when

¹⁰There is in fact variation for these lexically specified morphemes, in that sometimes it is allowed on the final syllable (Özçelik 2014, a.o.). I assume that some morphemes are lexically specified for an exceptional stress pattern. However, this does not matter for the discussion at hand. What is relevant is whether the stress assignment changes when other morphemes follow or precede certain morphemes. As will become clear, these patterns are independent from whether a morpheme is lexically specified for stress or not.

the suffixes are followed by other suffixes, (68). Also note that in both examples there is a single domain for vowel harmony, and as such the vowel harmony and the domain for stress assignment align.

(68) a. ($\underset{\bullet}{\text{koş}}\text{-tur} \quad \text{-'du}$)
 run -CAUS -PST
 ‘x made y run’ (based on Kornfilt 1997, 331)

b. ($\underset{\bullet}{\text{keşf}} \quad \text{-ed -il} \quad \text{-'di}$)
 discovery -do -PASS -PST
 ‘x was discovered (by y)’ (based on Kornfilt 1997, 323)

The pattern discussed here for stress is very similar to the Japanese pitch accent pattern that was discussed in the previous section: Both pitch and stress make reference to a word boundary, and not necessarily to a specific morpheme in that word. Before moving to different combinations, a note on the other phonological process discussed for Turkish is in order, namely vowel harmony. This is an assimilatory process in which vowels of a word have to match for certain features. In Turkish the relevant features are backness and roundness (Kornfilt 1997). I do not intend to give a complete overview of vowel harmony patterns in Turkish, but what is important here is when vowel harmony can be used to detect a single unit. when there is a single domain, it must mean that all vowels are in the same domain, i.e., in the same phonological word. Thus, for example, in (68a) the vowel of the past tense maker is /u/, which means it harmonizes in backness with the vowel from the verb stem, /o/. The reverse does not necessarily hold: having multiple vowel harmony domains is not necessarily indicative of multiple phonological or syntactic words, since there are various vowels that are pre-specified for vowel quality and as such can start a new vowel harmony domain inside the same word (Clements and Sezer 1982). This is for example the case with the progressive, (65a), where the final vowel in this morpheme is already specified and does not harmonize with the preceding vowels. What this means is that at this point stress and vowel harmony can pick out the same unit, a phonological word. The rule in (69) is written very informally, and will be revised later. Crucially, the relevant point is that when all vowels in a sequence of morphemes are harmonized, it must mean that there is a single unit, and this unit seems (for now) to align with the same unit that

is picked out for stress-assignment.

(69) *Turkish phonological processes (to be revised):*

- a. Apply stress to the last syllable of a word
- b. Apply vowel harmony to a word

This will be important for the remainder of the discussion, since there are going to be instances where stress and vowel harmony will diverge, which helps sharpen the notion of word. In certain TMA combinations (the generalizations for which combinations these are, is discussed in the next section in more detail), it is not possible to combine them inside a single word, with stress on the last syllable (70a-72a). In these cases an auxiliary is needed, and stress falls on the main verb and not the auxiliary, (70b-72b). The two forms of the auxiliaries seem to be allomorphs, depending on the TMA marker they need to host (Kornfilt 1997, Kelepir 2001, Sağ 2013).

- (70) a. *(yaz -**iyor** -**a'cak**)
 ● ● ●
 write -PROG -FUT
- b. (yaz -'iyor) (ol -**acak**)
 ● ● ● ●
 write -PROG AUX -FUT
 's/he will be writing'
- (71) a. *(konuş -**ur** -**du** -'lar)
 ● ● ● ●
 speak -HAB -PST -3.PL
- b. (konuş -'ur) (i -**di** -**ler**)
 ● ● ● ●
 speak -HAB AUX -PST -3.PL
 'They used to speak'
- (72) a. *(kal -**dı** -**sa** -'niz)
 ● ● ● ●
 stay -PST -COND -2.PL
- b. (kal -'dı) (i -**se** -**niz**)
 ● ● ● ●
 stay -PST AUX -COND -2.PL
 'If you have stayed'

Thus, coming back to stress assignment, in some cases stress can shift until it reaches the last syllable of the word for a certain combinations of morphemes. For other combinations, the stress assignment stops, as in the examples above, and an auxiliary is also present. Interestingly, there are also cases where this auxiliary form is not present, (73a-73b), or present in a different form, (73c). In these cases stress seems to fall in the middle of the word, but vowel harmony spans the marker

following the stressed morpheme: in (73a) the past tense marker harmonizes with the progressive marker, in (73b) the agreement and tense (both outside of the stress domain) harmonize with the verb stem; and in (73c) the conditional marker harmonizes with the vowel of the verb stem. Note that (73c) is different from (72a), since the stress needs to fall on the past tense marker in order to be grammatical. Thus, for vowel harmony reasons all suffixes on the main verb form a single word.

- (73) a. ((kal -'iyor) -du)
 • • •
 → → →
 stay -PROG -PST
 ‘was staying’
- b. ((konuş -'ur) -du -lar)
 • • • •
 → → → →
 speak -HAB -PST -3.PL
 ‘They used to speak’
- c. ((kal -'dı) -y -sa -nız)
 • • • •
 → → → →
 stay -PST -AUX -COND -2.PL
 ‘If you have stayed’

(Kabak and Vogel 2001, 323)

Thus, the rules discussed above, where vowel harmony and stress always align, do not align in this case: Stress seems to fall in the middle of the word, whereas vowel harmony picks out all the suffixes in the word. This pattern has been discussed in various places as an exceptional stress pattern (van der Hulst and van de Weijer 1991, Inkelas and Orgun 1998, 2003, Inkelas 1999, Kabak and Vogel 2001). In some of the literature on Turkish aspectual suffixes such as the progressive in (73a), or the prospective/future marker are taken to be suffixes that always require stress on them. Other suffixes, such as /y/ are said to be pre-stressing suffixes, or stress-less suffixes in that they can never bear stress and always require stress on the element before them. In other words, they are lexically specified to bear stress, or never have any stress, and this overrides any regular stress assignment. However, this runs into problems in various places. Both the past tense marker and the conditional marker can receive stress, when they are the sole suffix on the verb (70), or when it is the last suffix in combination with other suffixes, (68); but they do not have to receive stress, (73). Thus, it is not possible to mark the past for being always stressed; nor is it possible to argue that the conditional is pre-stressing, since it can carry stress. This means that it is not a property of the morphemes per se, but it is the environment they are in. Of course, it is possible to state that the

past tense marker in (73c) carries lexical stress, and that for some reason this needs to be deleted in case it is next to the progressive marker as in (73a). This might be the case, but it means that for each of the combinations the stress pattern needs to be idiosyncratically listed, and it means that in most cases stress is not regular at all in verbs.

This irregular stress pattern is not necessarily a phonological phenomenon, but it could be a side-effect of the syntax and the mapping to PF, which has been pointed out for some, but not all, feature combinations by Kornfilt (1997), Kahnemuyipour (2006), Kamali (2011b). In other words, the effect of stress falling in the middle of the verb is not a property of a specific morpheme, but is a property of what counts as a word boundary and where this boundary falls. If that is the case, we should find evidence for the fact that there are multiple words in (73). This is what will be discussed in the following section, and I show that there is evidence that there are in fact two words, and that vowel harmony can apply at a different time in the derivation than stress.

2.1.2.2 Syntax and words in Turkish

In order to look at word-hood tests that do not involve phonology, similar tests can be used as discussed for Japanese. Coordination and intervening elements can be used to see where the word-boundary falls in Turkish verbs. What will become clear is that the unit that is picked out for stress assignment is always picked out for syntactic tests as well. This is different from vowel harmony, which seems to mask the syntactic units.

Some of the coordination data is already discussed in the literature, sometimes under suspended affixation (Kornfilt 1996, Newell 2008, Zanon 2014). Here I review that data and add missing data to form a complete paradigm. It is possible to conjoin two units under a single auxiliary, (74a-75a), but it is not possible to conjoin two elements under aspectual markers, and have only the bare verbs conjoined, (74b-75b). This holds for both the /i/ auxiliary (74), as well as the /oll/ auxiliary, (75). The latter form of the auxiliary is not discussed as much in the literature, but is completely grammatical as well.

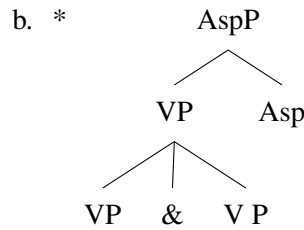
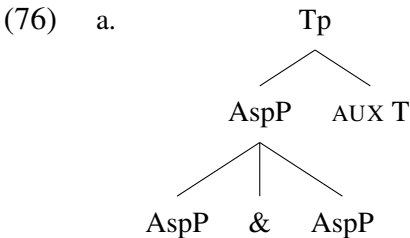
(74) a. [gel -'miş ve git -'miş]_{asp} i-di-m
 come -PRF and go -PRF AUX-PST-1.SG
 'I had come and gone'

b. *[gel ve git] -'miş i-di-m (??)
 come and go -PRF AUX-PST-1.SG

(75) a. [Yakal -iyor ve yi -yor]_{asp} ol-acak
 catch -PROG and eat -PROG AUX-FUT
 's/he will be catching and will be eating'

b.*[Yakala ve yi] -yor ol-acak.
 catch and eat -PROG AUX-FUT

Observe that in all these cases it is possible to conjoin the parts that contain stress, but that it is not possible to conjoin units that are missing the stressed morpheme. Thus, generally speaking, it is not possible to conjoin two verb stems, but it is possible to conjoin to verbs that contain a stressed morpheme under an auxiliary. This is similar to Japanese, where it is possible to conjoin Aspect phrases, but not VPs, (76).



Thus, descriptively it not possible to conjoin parts of syntactic words under a single suffix. Since the morpheme with the auxiliary does allow conjunction of the elements below it, it points to this element being separate from the verb stem. Coming back to the mismatch cases discussed in the previous section, it is also possible to look at the conjunction data in these cases. Recall that in these cases, repeated in (77a), stress seems to fall in the middle of the word, whereas vowel harmony treats all suffixes as a single unit.

(77) a. [kal -'iyor] -du]
 stay -PROG -PST
 'was staying'

b. [kal -'dı] -y -sa -niz]
 stay -PST -AUX -COND -2.PL
 'If you have stayed'

Crucially, the form of the auxiliary /i/ is dependent on phonological context. The full vowel shows up when it is at the left edge of a word boundary, the zero form occurs if it is in between two consonants, and the glide otherwise. My analysis is summarized in (78).¹¹ Thus, in case of (77b) the glide shows up because it is not at the edge of a word boundary, nor does it appear in between two consonants.¹²

- (78) a. AUX → i- / [# _____
 b. AUX → Ø / C _____ C
 c. AUX → y-

Both of the examples in (77) can also occur with the full vowel. In this case, stress remains in the same position (on the last syllable in the main verb), but the vowel harmony pattern differs. For example, the conditional marker /sA/ is pronounced with a low back vowel when it is in the same domain as another low back vowel, in case of (77b), but is pronounced as a mid front vowel when it is in the same domain as the auxiliary, (79b). Thus, underlyingly there are two words, but under certain phonological conditions they can create the appearance of a single unit.

- (79) a. [[kal -'iyor] [i -di]
 stay -PROG AUX -PST
 ‘was staying’
 b. [[kal -'di] [i -se -niz]
 stay -PST AUX -COND -2.PL
 ‘If you have stayed’

If it is the case that (77) and (79) are syntactically the same, and only the phonology is different, it is expected that (77) should behave syntactically the same as two words. This is shown for the auxiliary being pronounced as a full vowel or as a glide or zero element. That is, (74a) can alternate with the form given in (80), where the auxiliary is not pronounced. Thus, the past tense marker can in this case harmonize with the verb stem of the second conjunct, forming a phonological unit.

¹¹I take the glide as the underlying form, whereas in other analyses the full vowel is taken as the underlying form (Kornfilt 1997, a.o.). I assume that the glide is the underlying form since this requires only one step to go to zero or the full form, whereas there are two steps required to go from the full form to the zero form.

¹²It seems that the alternation for the full vowel versus the glide is one of register, and possible of different generations: Younger generations seem to prefer the glide/zero option, whereas older users, and in more formal language the full vowel is used. It might be the case that at some point the full vowel form is not used any more, but at this point I assume in the analysis that it is part of synchronic grammar.

- (80) [gel-'miş ve git-'miş]-ti-m
 come-PRF and go-PRF -PST-1.SG
 'I had come and gone' (Kornfilt 1996)

Thus, coordination and stress align, but vowel harmony does not have to. Coming back to the phonological rules in the previous section, it is now possible to refine the definition of 'word' as used for Turkish. Stress assignment aligns with units that are also relevant in the syntax, and thus we can say for now that stress applies when the syntactic word is built. Vowel harmony on the other hand can span, in some instances, more than one syntactic unit, and thus applies when a phonological word is built. The rules can thus be adapted as in (81).

- (81) *Turkish phonological processes*
- a. Apply stress to the last syllable of a *syntactic* word
 - b. Apply vowel harmony to a *phonological* word

Note that for now I assume that certain phonological processes, in this case stress, are sensitive to the same boundary for words that is part of the syntax, whereas other processes, such as vowel harmony do not. This means that, descriptively, vowel harmony cares about phonological words only, whereas stress is sensitive to syntactic words. How syntactic words are translated into phonological words is discussed in the next section. crucially, phonological units can be bigger than syntactic units, but if something is a unit in the syntax, this must be visible in the phonology as well.

However, as we have also seen in Japanese, this does not necessarily mean that the auxiliary and the main verb are two separate words: compound verbs can also conjoin parts of their word, but still behave differently when it comes to elements being allowed in between parts of the word. So, just as in Japanese, we can also look at intervening elements. I show below that the domain that is used for stress is also picked out for the boundary for where intervening elements can occur, even in the mismatched cases between stress and vowel harmony.

There are several markers that can occur in between words, even though generally larger units cannot. The elements include polar question particle /mI/ (also discussed in Kamali 2011a,b, Serova 2019), the additive focus particle /dA/ and the focus particle /bile/. Thus, in an indefinite object-verb

construction, (82a), it is not possible to have something intervene, (82b), unless it is one of these particles, (82c).

- (82) a. Kitap oku -(y)acağ -ım
 Book read -ASP -1.SG
 ‘I will read a book.’
- b. *Kitap **güzelce** oku -yacağ -ım
 book well read -ASP -1.SG
 ‘I will read a book well’
- c. Kitap { **bile / da / mı** } oku -yacağ -ım
 book even also Q read -ASP -1.SG
 ‘I will even/also read books’ / ‘will I read books?’

For these particles, it seems that, descriptively, they can attach to the right edge of phrases carrying focus and sentential stress (Kamali 2011b,a, Serova 2019); this is mostly discussed for the question particle in the literature, but the other particles behave the same. That is, in case of (82c) the object carries sentential stress. In some cases, for example in the case when there is a lack of any focused material, this polar question marker can attach to the verbal predicate. So in case of simple tenses, it attaches after the verb, and cannot show up in between the verb stem and the past tense marker, (83).

- (83) a. [yakala -'dı -n] =**mı**?
 catch -PST -2.SG =Q
 ‘Did you catch it’
- b. *[yakala] =**mı** -dı -n?
 catch =Q -PST -2.SG
 (Serova 2019, 93)

The same pattern holds for other morphemes, shown in (84-86). In all cases, the question particle /*mı*/ can attach after the stressed element (either the progressive or the future marker), but can never attach before the stressed morpheme (85b-86b). In (86a) it looks like the particle ends up in between two words: the verb and the auxiliary. This seems slightly different in case of (84-85) where it looks like the particle ends up in the middle of the word.

- (84) a. [yakala -ya'cak] =**mı** -sınız?
 catch -FUT =Q -2.PL
 ‘Are you all going to catch it’
- b. *[yakala] =**mı** -yacak -sınız?
 catch =Q -FUT -2.PL
 (Serova 2019, 93)

- (85) a. [yakal -'iyor] =**mu** -y -du
 catch -PROG =Q -AUX PST
 'Was s/he catching it?'
 b.*[yakala] =**mi** -iyor [i -di]
 catch =Q -PROG AUX -PST
- (86) a. [yakal -'iyor] =**mu** [ol -acak]
 catch -PROG =Q AUX -FUT
 'Will be catching?'
 b.*[yakala] =**mi** -iyor [ol -acak]
 catch =Q PROG AUX -FUT

The data is not surprising in light of the previous discussion on the alternation of the form of the auxiliary: It can show up as a glide in some contexts. Thus, the particles can attach to the verbal constituent, when it is stressed. This means that in all cases discussed above the particle attaches to a word boundary, and never shows up inside a word, even though there is a single domain for vowel harmony. The mismatch that is presented in (84b-85b) is exactly the same as discussed before: there is a single phonological word for vowel harmony, but stress picks out a smaller unit. Knowing what the phonological conditions on the auxiliary are, it is not surprising that the question particle shows up 'inside' the word, since 'inside' here refers to the vowel harmony domain, and thus the phonological word, but not the syntactic unit. Even though descriptively it looks like the particle attaches to a stress-bearing unit, it in fact attaches to a syntactic word (similar to Kamali 2011b's suggestion). The examples above can alternate with a full vowel, but this is slightly more marked for younger speakers, (87b). Note that in these cases the vowel harmony patterns alternate, just as with the examples (79).

- (87) a. [yakal -i'yor] =**mu** -y -**du**
 catch -PROG =Q -AUX PST
 'Was s/he catching it?'
 b. ??[yakal -i'yor] =**mu** [i -**di**]
 catch -PROG =Q AUX PST
 'Was s/he catching it?'

Before ending this section, there is one final note regarding the phonological analyses. One part of the analysis in several phonological analyses was that some morphemes are specified for being special (van der Hulst and van de Weijer 1991, Inkelas and Orgun 1998, 2003, Inkelas 1999, Kabak and Vogel 2001) and that they require stress on the morpheme in front of them. Some of

the morphemes that are said to be pre-stressing are /*mu*/ and /*y*/. However, if that is the case, it is surprising that when there is a sequence of pre-stressing morphemes, as is the case in (87a), stress still falls on the progressive, and not on /*mu*/, the suffix that is adjacent to the pre-stressing suffix /*y*/. It is possible to still analyze these patterns as exceptions to exceptions (cf. Özçelik 2014), but that misses the generalization that these elements in fact pattern with full auxiliaries, and particles that show up in various other contexts as well. Under the analysis here it is not necessary to have exceptional phonological rules for specific morphemes, nor is it necessary to state rules for exceptions to exceptions, since the stress patterns follow from the underlying syntactic structure and the fact that it can be shown that morphemes outside of the stress domain are syntactically independent.

To summarize, in Turkish there are two phonological phenomena that pick out ‘words’. In most cases this aligns, but there can be mismatches. Crucially, one phenomenon, the boundary for stress assignment, aligns with the units that can be coordinated, and can have intervening elements. These patterns can break up the vowel harmony pattern, suggesting that vowel harmony only occurs in the phonology after bigger phonological words are created. Thus, in this case, just as for Japanese, tense and aspect do not occur inside a single word in the syntax or morphology.

2.1.3 Taking stock

This section focused on various tests for word-hood in two languages that generally have been discussed as being highly agglutinating languages, Japanese and Turkish. I have shown that there is considerable variation in agglutinating ‘words’ and that in many cases there is evidence from both the phonology and the syntax that there are more units present than previously thought.

Crucially, even though not all tests align, there is a considerable amount of regularity when both phonology and syntax are taken into account. In Japanese, for example, there is a difference in restructuring verbs, which have been argued to have all types of syntactic effects, and also have verbs built in a different way from simple tenses. Thus, the fact that the phonology or the word-hood properties are different follows from a different way the words are built in the syntax. This means

that it is not necessary to state specific, exceptional phonological rules to account for the data, as has been proposed by van der Hulst and van de Weijer (1991), Inkelas and Orgun (1998, 2003), Inkelas (1999), Kabak and Vogel (2001) for Turkish. In Turkish on the other hand, I have discussed cases where not every phonological process aligns in every TMA combination. Again, I have shown that it is not necessary to stipulate that certain morphemes have exceptional stress rules, but that this aligns with various syntactic properties.

This means, on a more theoretical level, that even though there are different domains for words, it does not mean we have to throw away the notion of word altogether. Rather, we can refine the notion, and different components of grammar can pick out different units. But again, not anything goes. If there is a unit in the syntax, this unit is also visible in the phonology (i.e., intervening elements and stress in Turkish, intervening elements and pitch accent in Japanese). Moreover, there can be units in the phonology that are bigger than the units in the syntax (i.e., vowel harmony in Turkish periphrastic constructions).

What is not answered at this point is: why is it possible for most features to combine in phonological words, but why do some morphemes count as boundaries for syntactic words, whereas others do not? Are they simply listed as ‘closing suffixes’ (Aronoff and Fuhrhop 2002), or are there generalizations why it only occurs with certain affixes and not others. That is, when is there synthesis and when is there periphrasis? This is the focus of the next section where for both languages all feature combinations are discussed.

2.2 (Im)possible feature combinations

Taking into account the word-hood tests in the previous section, it is now possible to return to the discussion at the beginning of this section regarding variation in periphrastic structures. On the surface it seems like languages like English and Dutch have radically different word-hood restrictions than Japanese or Turkish, in that the former languages have more periphrastic constructions. However, as shown in the previous section, there might be less variation between

these languages when carefully looking at the phonology and syntax of the more ‘agglutinating’ languages. What remains to be looked at at this point is which feature combinations are possible in a single phonological and syntactic unit, and which feature combinations are not. This is discussed in Sec. 2.2.1. I argue that both Japanese and Turkish have more periphrastic patterns than previously thought, and are in fact very similar to a language like English, in that all these languages have a split between aspect and tense. I provide derivations in Sec 2.3, where I argue that the synthetic-periphrastic alternation can be understood as an effect of syntactic phase boundaries. This idea has various implications for head movement and phase theory, which is discussed in the following chapters.

2.2.1 Japanese

The following contains a list of morphemes on Japanese verbs. The list contains voice, modality, tense and aspect morphology. As mentioned in the previous section, there are several morphemes that look like suffixes, but show different syntactic and phonological behavior. These are presented in (93-94), in the order in which they can occur on the verb.

- | | | |
|-------------------------------------|------------------------------------|-------------------------------|
| (88) <u>Voice</u> | (90) <u>Aspect</u> | (92) <u>Modality and Mood</u> |
| a. Passive: <i>rare</i> | a. Prog: <i>-te</i> | a. Assertion: <i>yo</i> |
| b. Causative: <i>sase</i> | (91) <u>Tense</u> | b. Confirmation(?): <i>ne</i> |
| (89) <u>Low Modality</u> | a. Past: <i>-ta</i> | c. Question: <i>no</i> |
| a. Ability <i>rare</i> | b. Present: <i>-(r)-u</i> | d. Quotation: <i>to</i> |
| (93) <u>Aspectual restructuring</u> | (94) <u>Modality restructuring</u> | |
| a. Inceptive: <i>hajime</i> | a. Potential: <i>rare</i> | |
| b. Durative: <i>tsuzuke</i> | b. Want: <i>tagar</i> | |
| c. Terminative: <i>oe</i> | | |

Separating out these two types of morphemes in (88-92) from (93-94) reduces the list of TMA markers on the Japanese verbs considerable. Many of the limitations on combinations have been

discussed in the previous section, but will be put together here in a systematic way.

First of all, all the markers that are hierarchically lower and thus closer to the verb, such as voice and low modality, are always suffixes, and are not separable from the verb stem in the syntax or the phonology.¹³ These markers can be combined with each other, or with the aspectual or tense layer, but not with both. The following table only gives the combinations for two suffixes, Tab. 2.4. Only the combination of the aspectual marker with Tense is not possible inside a single verb form.

Caus	Pass	Mod	Asp
Caus-Pres	Pass-Pres	Mod-Pres	✗Asp-Pres
Caus-Past	Pass-Past	Mod-Past	✗ Asp-Past
Caus-Asp	Pass-Asp	Mod-Asp	
Caus-Mod	Pass-Mod		
Caus-Pass	Pass-Pass		

Table 2.4: Japanese Affix combinations

When multiple affixes are combined, it is possible to do this as long as Aspect and Tense do not end up in the same syntactic word. Thus, it is possible to combine three affixes on the syntactic word, (95) or four, (96) but it can never contain tense and aspect. Thus, the restriction is not about the number of affixes, because the verb can contain four affixes; the restriction is about the type of affixes that are combined. Even when Tense and Aspect are the sole affixes on the verb, they cannot be combined.¹⁴

- | | |
|------------------------|----------------------------|
| (95) a. Caus-Pass-Pres | f. ✗Caus-Asp-Past |
| b. Caus-Mod-Pres | g. Caus-Pass-Asp |
| c. ✗Caus-Asp-Pres | h. Caus-Mod-Asp |
| d. Caus-Pass-Pst | (96) a. Caus-Pass-Mod-Pres |
| e. Caus-Mod-Pres | b. Caus-Pass-Mod-Past |

¹³The voice domain might consist of a high and a low causative (Kuroda 1993, Miyagawa 1998, Harley 2008). Both pattern the same phonologically. The differences in the syntax pertain to the type of arguments the head takes, and what type of restructuring verbs are available to be combined with. Since they do not behave differently with regard to word-hood syntactically or phonologically I do not discuss them here, or list them as different morphemes.

¹⁴I have only given the combinations starting with the causative, but the same observations hold for any of the other combinations.

- | | |
|--------------------------------|--------------------------------------|
| c. \times Caus-Pass-Asp-Pres | f. \times Caus-Mod-Asp-Past |
| d. \times Caus-Pass-Asp-Past | g. Caus-Pass-Mod-Asp |
| e. \times Caus-Mod-Asp-Pres | (97) a. \times Caus-Pass-Mod-Asp-T |

Thus, tense and aspect combinations always lead to an auxiliary, whereas all elements below these heads can be combined. For the higher, C, domain, all the elements that are related to speech act, modality and mood can never form a single phonological or syntactic unit with the verb stem, voice, modality, aspect, or tense markers. As shown in the previous section, syntactically they can be separated from the verb, and show up in various places, and phonologically they never are part of the pitch accent domain. Tense, on the other hand, is variable between being a suffix and an independent element: it can be part of the syntactic verbal complex if there is no aspect present, otherwise it is an auxiliary, this is also already present in the data presented above. The fact that C elements are never part of the aspect domain is expected, since both present and past tense are marked on the verb. This is then different from a language like Turkish, where present tense is not overtly marked and C elements can attach to the verb, as presented in the next section, 2.2.2.

Thus, both C and T elements have to (C) or can (T) outside of the syntactic and phonological word of the verb. They only differ in what type of host they need: C elements can attach to any type of host (verbal and non-verbal), whereas T elements always require a verbal host which can be the main verb or an auxiliary.

2.2.2 Turkish

The following contains TMA markers in Turkish, and the verbal template. The verbal template contains the order of morphemes on the verb, (98); the list contains the overt morphemes. The list is based on a couple of sources, and consulting G. Güneş, H. Sevgi and (Kornfilt 1997, Cinque 2001, Keleşir 2001, Sağ 2013, Zanon 2014).¹⁵

¹⁵Note that I have split up the morphemes in different ways than in the literature. For example, in the literature, the progressive, the perfect, the habitual and the prospective have been taken as four aspectual markers that need to occur in the same 'slot' on the verb, and count as so called closing suffixes, in that no other morpheme can attach after them. However, the Perfect has been argued cross-linguistically to exist in a different position in the clausal spine, which

- (98) V -VOICE -LOW MOD. -ASP₁ -ASP₂ -HIGH MOD. -TENSE -MOOD
- | | |
|---|--|
| <p>(99) <u>Voice</u></p> <p style="margin-left: 20px;">a. pass.: <i>Il</i></p> <p style="margin-left: 20px;">b. caus.: <i>Dlr</i></p> <p>(100) <u>Low mod.</u></p> <p style="margin-left: 20px;">a. ability: <i>Abil</i></p> <p>(101) <u>Aspect 1</u></p> <p style="margin-left: 20px;">a. hab.: <i>Ar</i></p> <p style="margin-left: 20px;">b. prog.: <i>Iyor</i></p> <p style="margin-left: 20px;">c. Prosp.: <i>AcAK</i></p> <p>(102) <u>Aspect 2</u></p> <p style="margin-left: 20px;">a. perfect: <i>mIş</i></p> | <p>(103) <u>High mod.</u></p> <p style="margin-left: 20px;">a. neces.: <i>mAlI</i></p> <p style="margin-left: 20px;">b. possi.: <i>Abil</i></p> <p>(104) <u>Tense</u></p> <p style="margin-left: 20px;">a. future: <i>AcAK</i></p> <p style="margin-left: 20px;">b. anterior: <i>DI</i></p> <p>(105) <u>Mood</u></p> <p style="margin-left: 20px;">a. evaluative: <i>sA</i></p> <p style="margin-left: 20px;">b. evidential: <i>mIş</i></p> <p style="margin-left: 20px;">c. past: <i>DI</i></p> <p style="margin-left: 20px;">d. irrealis <i>sA</i></p> |
|---|--|

Each morpheme can attach to the verb by itself, without any other morphemes (Fenger 2017). Part of this was shown in the previous section. Each of the morphemes, when they are attached as the sole suffix, forms a single phonological domain for stress with the verb. In terms of possible combinations that are not ruled out for semantic reasons, the picture is similar to Japanese when it comes to the voice and low modality domain, and the mood domain: voice and low modality markers can be combined with one higher morpheme, and all of the mood morphemes need to be expressed as auxiliaries. This is also represented in (98) by the categories that are inside the box: categories outside of the box cannot be combined with each other. The picture is slightly more complex than Japanese when it comes to the combinations of tense and aspect, since there are more aspectual distinctions than in Japanese. As soon as any of the markers starting from aspect ends up on the verb, all other morphemes will be expressed as auxiliaries, (106), and stress falls on the last morpheme in the verb-word, i.e., the aspect marker. Thus, it is possible to combine the causative and the progressive onto the verb, but then any other morphemes need to be expressed as auxiliaries, in this case a modality marker and the past marker.

means that it is no surprise that this marker cannot combine with any of the other aspectual morphemes (see also Ch 3 Sec. 3.3.2 and Chapter 5 Sec. 5.2.2.3 with regard to similarities and differences in Perfect constructions).

- (106) [bit -ir -'iyor] [ol -malı] [i -di]
 finish -CAUS -PROG AUX -NEC AUX -PST
 's/he had to be finishing' (adapted from Kornfilt 1997)

Thus, taking the order in (98) to represent a hierarchical structure, similarly to Japanese, all morphemes below aspect can combine, but above this every other morpheme needs to be expressed as an auxiliary. In Turkish, it is possible for any of the higher morphemes to end up on the verb, when there is no overt aspectual or tense value. That is, in the present tense, any of the mood markers can end up on the verb. Contrary to Turkish, Japanese does have an overt marker for present tense. Thus, in Japanese C-elements can never occur on the verb, because all values of Tense are overtly expressed. Moreover, all morphemes in Turkish are required to be hosted by verbal material, and it is not the case that some elements can stand on their own. All of the morphemes are either hosted by the main verb, or a form of the verb 'to be', which can show up as different allomorphs, depending on the feature they attach to. This is also shown in (106), where the necessity marker is hosted by *ol*, but the past marker is hosted by *i*.

To summarize, most features in both Japanese and Turkish can be combined into a *phonological* word, but both languages have restrictions as to which features can be combined into a *syntactic* word. Even though the languages have a slightly different feature inventory, they have the same cut-off point, after aspect. Before moving to the analysis, just a small note about cross-linguistic comparison (more detailed discussed is in the next chapter). The (smaller) syntactic units that are picked out in these two head final languages are similar to units picked out in English. Only one example is given in (107), for viewpoint aspect and tense.

- (107) a. Ziggy [play -ed] guitar (jamming good with Weird and Gilly)
 b. *Ziggy [play -ing -ed] guitar
 c. Ziggy [was] [play -ing] guitar

Thus, in all three languages, Japanese, Turkish, and English it is possible to combine an inflectional feature like tense on the verb, but as soon as there are combinations for aspect and tense, this is not possible anymore. Not only is there an alignment between smaller phonological

constituents and syntactic constituents, these syntactic constituents also seem to be predictable based on their feature content. Deriving this pattern for Japanese and Turkish is the focus of the next section. I assume that word building can be timed at different stages of the derivation, and that some word building operations are sensitive to phases. This will lead to the variation in word-hood. The next chapter will explore the consequences for cross-linguistic variation.

2.3 Proposal and derivations

This section focuses on deriving the patterns discussed for Japanese and Turkish. The following differences need to be derived: a synthetic verb form (108), a periphrastic verb form, (109), and a larger phonological word that consists of a periphrastic form, (110), and finally, the Japanese restructuring verbs, (111). The data below are repeated from the previous section for Japanese on the left and Turkish on the right. I have given for both the constituency for the phonological words and the syntactic constituents. For those phonemes in Turkish where the phonological form depends on the phonological context, the phonemes are represented in capital letters.

- (108) a. i. (L H H L)
he. da. ta. ta.)
ii. [hedata -ta]
be.distant -PST
'It was distant'
- b. i. (kal'dı) [Synthetic]
●→
ii. [kal -'DI]
stay -PST
's/he stayed'
- (109) a. i. ((L H H L) L L)
he. da. ta. te. i. ta.
ii. [hedatar -te] [i -ta]
be.distant -ASP AUX -PST
'It is being distant'
- b. i. (kal'iyor) (idi) [Periphrastic]
●→ ●→
ii. [kal -Iyor] [i -DI]
stay -PROG AUX -PST
'was staying'

- (110) a. i. (L H H L) L) b. i. ((kal'iyor) du) [Mismatch]
 he. da. ta. te. ta.
 ii. [[hedatar -te] -ta] ii. [[kal -Iyor] DI]
 be.distant -ASP -PST stay -PROG PST
 ‘It is being distant’ ‘was staying’
- (111) a. (L H H H H H H L) [Root Root]
 he. da. ta. ri. ha. ji. me. ru.
 b. [[hedatar -i] -hajime -ru]
 be.distant -INF -begin -PRS
 ‘begin to be distant’

The (109) and (110b) examples will have the same syntactic and morphological derivation, but the difference comes from the phonology. I propose that (progressive) aspect is a phase head (following Aelbrecht 2010, Harwood 2013, 2015, Aelbrecht and Harwood 2015, Wurmbrand 2017). When this head is marked for a feature value, it delimits the syntactic word, which has effects on auxiliary formation and phonological processes. How this derives the difference between (108) and (109) is discussed in Sec. 2.3.1. Basically, the syntactic and morphological derivations for Japanese and Turkish are the same. What is different is when stress, vowel harmony, and pitch accent assignment takes place. Both (110) and (111) are different from synthetic verb forms, and form a type of ‘word-within-word’ and will be discussed in Sec. 2.3.2. The (110b) cases are syntactically the same as (109), but have an additional phonological operation. The root-root verbs in (111) also involve head movement, but since *hajime* is a different type or morpheme it behaves like a compound structure, as also discussed in Section 2.1.2.

2.3.1 Synthesis versus periphrasis

This section focuses on cases where head movement is blocked and when it is not. Basically, the syntactic and morphological derivations for Japanese and Turkish are the same. What is different is when stress, vowel harmony, and pitch accent assignment takes place. I assume that there is a general constraint against certain features remaining stranded without a host in both languages, and there are several ways this can be resolved, (85). I represent this by assuming that certain heads are

a bound morpheme, or an affix (AFF). One option is to do head movement, in which case the (main) verb forms a complex head with an inflectional feature. A different option is to insert an auxiliary as a repair (following Bjorkman 2011, Calabrese 2019).

(112) Infl Constraint: $*[AFF]_{x^0}$

a. Head movement: $[V \text{ AFF}]_{x^0}$

b. Auxiliary insertion: $[AFF]_{x^0} \rightarrow [AUX \text{ AFF}]_{x^0}$

This section focuses on when head movement takes place and when auxiliary insertion is needed. I propose that phase heads can delimit the syntactic word. That is, they can block head movement, (113).¹⁶ When this happens, auxiliaries are inserted to host inflectional heads that cannot be hosted by the main verb.

(113) **Proposal:** Phase heads can stop head movement

Second, I assume that head movement takes place after syntactic material is sent to spell-out (Chomsky 2001, Schoorlemmer and Temmerman 2012, a.o.).¹⁷ I assume, following Aelbrecht (2010), Harwood (2013, 2015), Aelbrecht and Harwood (2015), Wurmbrand (2017) that aspect can be part of the inner phase. This means that there is a phase-boundary above aspect, and that the aspect head is the phase head. Thus, when material is sent to spell-out, including aspect, a complex head is formed including all heads starting from the verb up until the aspect head. Third, I propose that there is an additional operation that can feed or bleed the spell-out of words. This is the removal of unmarked heads (which can be modeled as obliteration or pruning Arregi and Nevins 2007, Embick 2010). Crucially, when a phase head does not carry any feature specifications, it can be removed in the morphology and is not interpreted in the phonology. Thus, when aspect does not carry any feature specifications a tense feature can still move onto the verb. However, when the phase head remains part of the complex head formed through movement, this complex unit is

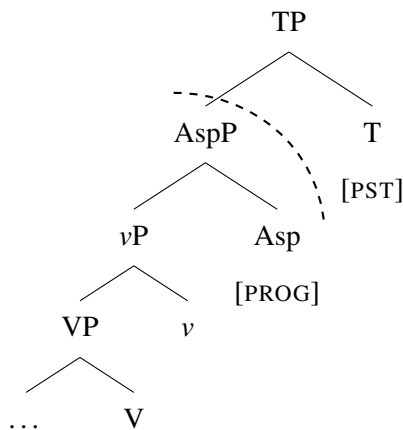
¹⁶See Ch. 4 for the relation between auxiliaries, phases and word-building. The idea presented here is in the same spirit as proposals that take words to be delimited by phases (Wojdak 2005, Compton and Pittman 2010), and proposals that assume that X^0 cannot cross certain boundaries (Li 1990).

¹⁷See Ch. 3 for a discussion of the order of head movement and sending material to spell-out, and how languages can vary these options, leading to different patterns in the data.

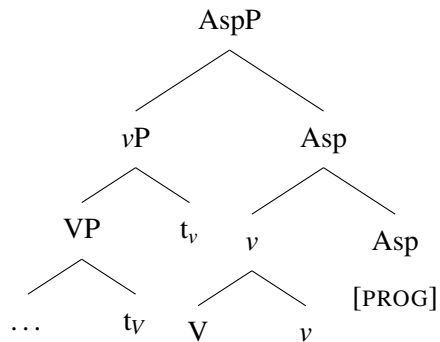
interpreted in the phonology and any heads in higher domains (such as T) requiring a morphological host cannot join this verb anymore. This gives the result between periphrastic and synthetic verb forms. I show in the following how this works concretely.

First, the derivation for a periphrastic verb is given. In this case both Aspect and Tense carry a feature; PROG in case of the aspect head, and PST in case of the tense head. (114). I assume, following Aelbrecht (2010), Harwood (2013, 2015), Aelbrecht and Harwood (2015), Wurmbrand (2017) that aspect can be part of the inner phase. This means that there is a phase-boundary above aspect, and that the aspect head is the phase head. Second, I assume that for word building, at least all the heads inside the phase, including the phase-head, are sent to spell-out, and after this material is sent to spell-out movement takes place. This is different from proposals that assume that the complement of the phase-head is sent to spell-out (Chomsky 2000, 2001). For now, I follow proposals that assume the whole phase is sent to spell-out (Holmberg 1999, 2001, Fox and Pesetsky 2003, Bošković 2014, Harwood 2014, Aelbrecht 2016). Thus, when the phase is built, all heads including the aspectual head get sent to spell-out, where head movement takes place, (115). This leads to a complex head including the verb-stem, little v, and aspect.

(114) Syntax PROG-PST



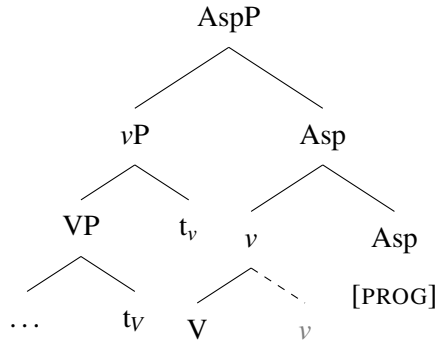
(115) Movement, First Cycle



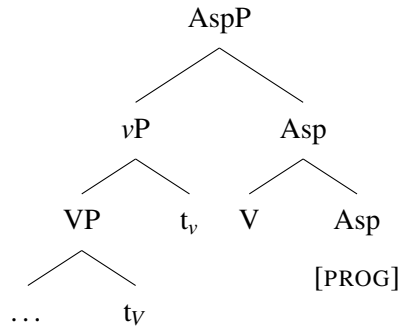
After this, in the complex head morphological operations can take place. The relevant operation that interacts with word building is the removal of unmarked heads. For now I call this operation

remove, and can be modeled as pruning (Embick 2010) or obliteration (Arregi and Nevins 2007)).¹⁸ I represent the removal of unmarked heads in (117). In this case only v gets pruned, because there is a marked feature in the aspectual head.

(116) Removal, First Cycle



(117) After Removal



Crucially, the phase head remains present in the complex head and I propose that when this is the case, the word can be interpreted by the phonology. That is, the phase head induces a word-boundary, and delimits the syntactic word. This proposal is given in (118).

(118) **Proposal:** X^0 with a phase head are interpreted in the phonology

What this means is that at this point the syntactic word built in the first phase can receive phonological material. I illustrate this for both Turkish and Japanese. The derivation for Turkish proceeds as follows. The rules for stress and vowel harmony are repeated and modified from Sec. 2.1.2.1, and given in (119). The rules are adapted from Güneş 2009, Kabak and Vogel 2001).¹⁹ Crucially, the result was that stress is sensitive to syntactic word boundaries, whereas vowel harmony is not.

(119) a. Stress on every last syllable of every highest X^0 with a root [Turkish]

¹⁸It might be that this operation is not privileged to the morphology, but also takes place in other domains. See the papers in Murphy (2019) for an overview.

¹⁹At this point I am not concerning myself with the fact that vowel harmony can be sensitive to specific vowels. Importantly for the story here is the fact that if there is a single domain for vowel harmony, it must be the case that there is a single complex head.

b. Apply vowel harmony at every ω

The derivation for Turkish is then as follows. I assume that first Vocabulary insertion takes place, and second stress assignment. As soon as stress assignment takes place the complex head is translated into a phonological unit, and then vowel harmony takes place. This surface form is then fed back into the syntax, into the highest node, the aspectual head.

(120)

Phonological grouping	
a. vocabulary insertion	[[/kal/] _V] /Iyor/] _{ASP(+PROG)}
b. stress assignment	[(/kalI'yor/) _ω] _{ASP(+PROG)}
c. vowel harmony	[(/kɑlɪ'yor/) _ω] _{ASP(+PROG)}
d. <u>Surface form</u>	[(/kɑlɪ'yor/) _ω] _{ASP(+PROG)}

For Japanese, the rules for pitch accent are repeated in (121-122), and the derivation is given in (123). For accented verbs it means that the word boundary is clearly visible since there is a low pitch assigned to the last syllable on the right edge of the word.

(121) $\emptyset \rightarrow L / [v^x \dots \sigma] \#$ [Accented verbs]

(122) a. $\emptyset \rightarrow L / \#[\sigma \dots$ [Pitch first syllable]

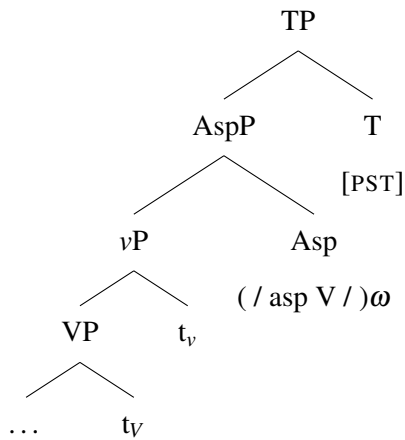
b. $\emptyset \rightarrow H$ [Pitch remaining syllables]

(123)

Phonological Grouping	
a. Vocabulary insertion	[[/hedatar/] _V /te/] _{asp(+prog)}
b. Pitch diacritic	L [(/he. da. ta. te./) _ω] _{asp(+prog)}
c. Pitch contour	L H H L [(/he. da. ta. te./) _ω] _{asp(+prog)}
d. <u>surface form</u>	L H H L [(/he. da. ta. te./) _ω] _{asp(+prog)}

To summarize, at this point the heads in the first domain, up until Asp, are spelled out and form a phonological word. When the second domain gets sent to spell out, (124), the structure is as follows. There is a phonological word that is present in Asp[+prog], and T is not interpreted phonologically yet. Crucially, T in these languages needs a host of the type ‘root’, and this is not available in the derivation anymore, since the output of the first cycle is a phonological unit without any morphological information except for the highest head (Asp[+prog]). Thus, this means that T is stranded.

(124) Second Cycle, stranded heads



In order to rescue the tense head, an auxiliary is inserted, in order to provide T with a root-like element. I assume AUX is not a VP in the syntax (Bach 1967, Embick 2000, Cowper 2010, Bjorkman 2011, Arregi and Klecha 2015, Pietraszko 2017) and does not contribute any meaning, (Pollock 1989, Chomsky 1993, Rothstein 1999, Iatridou et al. 2003). Since both Japanese and Turkish have a constraint against stranded inflectional heads, and head movement is not possible anymore, a repair which inserts an auxiliary is needed (following Bjorkman 2011, Calabrese 2019):

- (125) a. Infl Constraint: *[AFF]_{x,0}
 b. Auxiliary insertion: [AFF]_{x,0} → [AUX AFF]_{x,0}

The fact that there is now a main verb and an auxiliary, leads to differences with regard to the phonological processes. As was discussed in Sec. 2.1 for Turkish stress and Japanese Pitch Accent, I assume that stress and pitch accent are only assigned to material that has a lexical element (a

root), and not to functional material, i.e., auxiliaries (Selkirk 1995, a.o).²⁰ This means that pitch accent in both Japanese and Turkish is assigned to the main verb, but not to the auxiliary, as was shown in (120) for Turkish and in (123) for Japanese. This means that in a periphrastic construction in Turkish only the main verb receives stress. Vowel Harmony in Turkish, and other processes such as gemination, deletion, voicing, etc. are purely phonological and do not distinguish between functional or lexical material; this can mean that there are multiple vowel harmony domains in Turkish (one for the main verb, and one for the auxiliary). The Turkish full periphrastic construction is given in (126). In Japanese, on the other hand, the pitch accent domain ends after the main verb and the auxiliary construction follows the pattern for pitch from before (H in unaccented verbs, L in accented verbs), as discussed in Sec. 2.1.1. In this case, since the main verb is an accented verb and ends with a low pitch, the auxiliary receives low pitch as well, (127).²¹

(126) (kal'ıyor) (idi)

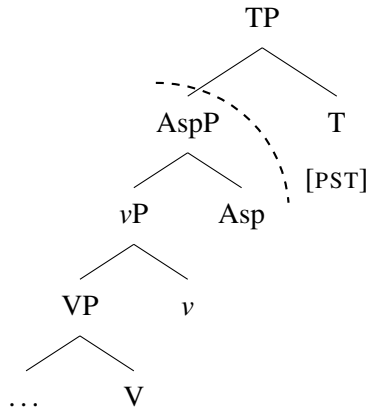
(127) ((L H H L) LL)
he. da. ta. te. i. ru.

With this in mind I turn to synthetic verb forms. In this case, the underlying structure in the syntax is as in (128) for both the Turkish and Japanese simple past tense. The only head that carries a feature is Tense, for PST. The derivation proceeds the same as for a periphrastic construction where the whole phase gets sent to spell-out, including aspect. Once this happens head movement in that spell-out domain happens, (129). Removal of unmarked heads can take place, (131). Crucially, this means that the phase heads gets removed, since there is no material in the aspectual head.

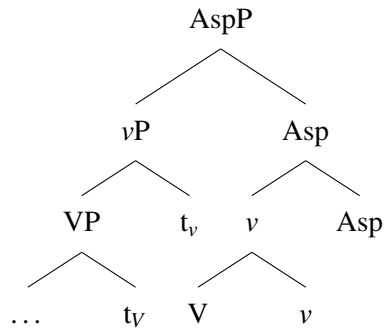
²⁰I assume that these elements cannot receive default stress. However, it is possible for auxiliaries to receive stress when focused. I assume that this type of stress assignment is different from the stress discussed here.

²¹See the following section for a discussion on the spreading of pitch accent.

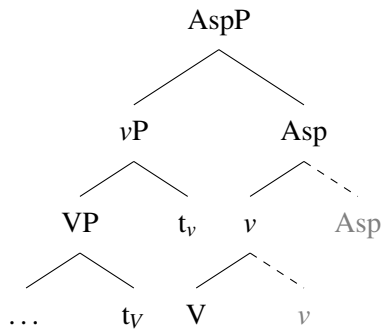
(128) Past Tense



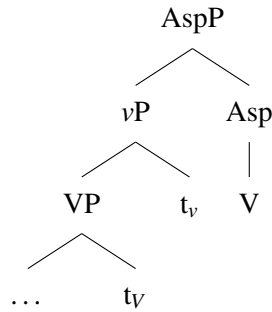
(129) Movement, First Cycle



(130) Removal, First Cycle

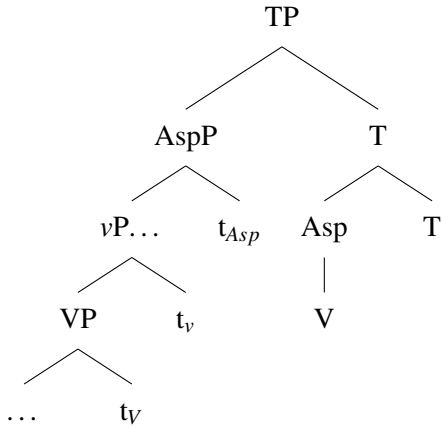


(131) After Removal



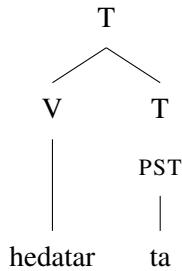
As mentioned for the periphrastic constructions, I assume that when the phase head is present, the whole word is closed off and interpreted in the phonology. However, when this head is not present anymore, the output is fed back into the syntax. Thus, the pruning of the phase head affects the interleaving of syntax and PF: in this case, a complex head without phonology is fed back into the syntax. Then, in the second spell-out domain, I assume that it is still possible for the tense head to get on the verb, (132). Since this movement takes place after spell-out, at PF, the direction can be upwards or downwards. This means that we end up with a single complex head including the verb stem and the tense head.

(132) Movement, second cycle

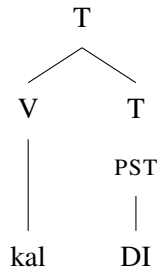


At this point, the whole complex head can be spelled out. This leads to the following, (133-134), for Japanese and Turkish respectively. For Turkish the underlying phonological forms are given in capital letters because they can change depending on the phonological environment.

(133)



(134)



At this point the phonological processes apply. For Turkish this means that the form in (108b) is pronounced as in (135), which is the desired result. For Japanese the final form is given in (136). Because the verb is an accented verb, the final syllable receives a low pitch.²²

²²As mentioned in footnote 3, there is variation whether the past tense is the morpheme on which the pitch contour ends or not, (1).

(1) L H L L
he da ta ta

If this is representing a syntactic difference where the past tense is in fact separate from the main verb, it could be analyzed as a type of local dislocation (as was done in Yamada 2019, following Embick and Noyer 2001), see also next section. This would then mean that first the main verb is built and spelled out, and only after pitch has been assigned the tense head moves onto the verb. This would predict that there should be evidence the tense head remains separate in the syntax. However, this analysis is problematic for various reasons. It is not clear why the present tense is always part of the pitch contour, and why present and past morphology behave the same in the syntax with regard to intervening elements and the conjunction facts discussed in Sec. 2.1.1.2. This means that these facts require more scrutiny, and it is

(135) [kal'dı]

(136) L H H L
he da ta ta

At this point I have given a derivation for a periphrastic verb construction and a synthetic verb form by assuming that overt aspect delimits the syntactic word. This then immediately raises the question why the Japanese verbs with lexical aspect markers such as *hajime* do not form a periphrastic construction, where tense morphology is expressed on an auxiliary. The proposals that argue for aspect being a phase mostly focus on English, where progressive is the aspectual head that forms the phase head (see also Ch. 4 for more discussion on this). However, in case of the aspectual morphemes like *hajime*, the form is a root, or a lexical element and as such they do not form a phase head and thus behave the same as synthetic verb forms with respect to the expression of tense.²³

Finally, I argued that in case of synthetic verbs there is a single step of movement for the tense head rather than head movement in the syntax, (132). This means that I stipulated that head movement only occurs in the first domain and not in the second domain, and that morphological movement, which is a local operation between two heads, can only happen once. This is similar to the treatment of lowering in Hanink (2018) in that this type of movement is sensitive to structural adjacency (contra Harizanov and Gribanova 2019, Pietraszko 2019, Arregi and Pietraszko 2019b).²⁴ In fact, it is not possible for any other heads to be pronounced in a single syntactic unit. Thus, any of the inflectional features higher in the clause need to be expressed as auxiliaries. An example from Sec. (2.1.2.2) is repeated in (137). In this case neither the necessity marker nor the past tense marker can combine on the main verb, nor form a single unit together. I interpret this as head movement only being possible in the first domain.

(137) [bit -ir -'iyor] [ol -malı] [i -di]
finish -CAUS -PROG AUX -NEC AUX -PST
's/he had to be finishing'

important to determine what the past /present distinction is, and if the present tense marker is in fact not a tense marker at all, but is positioned elsewhere in the clausal spine (Yamada 2019). For now I thus analyze the past tense marker as extrametrical, following Nishiyama (2010).

²³See also Ch. 5 for a cross-linguistic discussion of these type of elements.

²⁴See also the next chapter for the different movement options and locality conditions.

This analysis makes various assumptions and predictions that will be explored in the next chapters. First of all, I assumed that the timing of movement is important, which will be explored in the next chapter. Second, since I assume that periphrasis is derived through phases, it makes predictions how auxiliaries pattern with other phenomena that have been argued to be sensitive to phases. In this regard, it is also important to explore the simple tenses where the phase head gets removed in the morphology, but not in the syntax. It should be expected that the phase should still be visible in the syntax in these cases. This will be explored in chapter 4. Third, I make a distinction between *nas* to which categories count as phases. Again, as with simple tenses, this should be visible with other phenomena as well, and this distinction should be visible in cross-linguistics variation with regard to auxiliary patterns as well. This variation will be explored in Chapter 5. Finally, I have argued that head movement takes place at spell-out (and only in the first domain) and I made a distinction between movement before and after phonological information has been present (see next section). These have not been argued to be the only timing options for movement, however. The interaction of different types of word-formation will be discussed in the next chapter. Before moving to the next chapter, I focus on the mismatches that have been discussed for Turkish and Japanese where there are apparent words-within-words.

2.3.2 Words within Words

The last piece of data that still needs to be accounted for are the examples repeated in (138) for Turkish and Japanese. In both cases there is no auxiliary present, but the tense forms are not part of the syntactic word. This is visible in Japanese in the pitch contour, where the tense form is not part of it, (138a). In Turkish this is visible with the stress pattern, where in (138b) stress falls on the progressive marker rather than the tense morpheme. However, it is not the case that the tense markers are completely separate, since they are hosted by the main verb. In Turkish this is visible in the vowel harmony pattern, where the vowel in the past tense morpheme harmonizes with the verb stem. Moreover, I have shown in Sec. 2.1 that syntactically these units pattern with periphrastic constructions: thus, the auxiliary is deleted in certain environments, but the unit that is picked out

for the pitch contour and stress aligns with the verb-word in periphrastic constructions.

- (138) a. i. (L H H L) L) b. i. ((kal'iyor) du) [Mismatch]
 he. da. ta. te. ta.
 ii. [[hedatar -te] -ta] ii. [[kal -Iyor] DI]
 be.distant -ASP -PST stay -PROG PST
 'It is being distant' 'was staying'

I first derive the Turkish mismatch, because it is the clearest case: stress seems to occur in the middle of the word, whereas there is a single domain for vowel harmony including the auxiliary. However, the same movement operation that I propose applies to Japanese as well. Crucially, what needs to be explained is the fact that in synthetic verb forms stress and vowel harmony patterns align, but they mismatch in cases above (138b). I have shown in Sec. 2.1.2.2 that syntactically the mismatched cases still behave as two syntactic words. That is, it is possible to separate the past tense morpheme. Moreover, I have shown that the presence or absence of the auxiliary is phonological, the rules are repeated in (139). The full form, (140a) can alternate with a zero form when it occurs between two consonants, (138b) and can occur as a glide elsewhere, (140b). The zero form is present with different morpheme combinations as well, as long as the auxiliary occurs between two vowels, (140c).

- (139) a. AUX → i- / [# _____]
 b. AUX → Ø / C _____ C
 c. AUX → y-
- (140) a. [[kal -'iyor] [i -di]
 stay -PROG AUX -PST
 'was staying'
- b. [[kal -'dı] y -sa -niz]
 stay -PST AUX -COND -2.PL
 'If you have stayed'
- c. [[konuş -'ur] -du -lar]
 speak -HAB -PST -3.PL
 'They used to speak'

(Kabak and Vogel 2001, 323)

Based on (138b) it could be possible to analyze this as a case where the tense head does not have an appropriate host and becomes part of the main verb. However, as (140b) shows, the auxiliary is still visible. Thus, this means that the syntactic requirements of the inflectional head needing a host are met, and that it is optional to pronounce the auxiliary with a full vowel or not. Moreover, the conclusion from the investigation in Turkish was that the mismatch between stress and vowel harmony is not due to specific phonological rules, where certain affixes block or attract stress. That is, stress and vowel harmony always are sensitive to the same boundary, but this boundary can change. The rules are repeated in (141).

- (141) a. Stress on every last syllable of every highest X^0 with a root [Turkish]
 b. Apply vowel harmony at every highest ω

In order to keep the rules the same, I propose that the solution comes from the timing of when the stress and vowel harmony rules apply.²⁵ Crucially, when the auxiliary attaches to the main verb, it must be the case that there is already phonological information, at least for the main verb, since stress must have applied. I propose that these cases can be derived via a form of local dislocation (Embick and Noyer 2001, Embick 2007).²⁶ This operation operates on two linearized syntactic words and makes them into a single unit. However, as mentioned, at least some of the morphological head must have phonological information. To this end, I assume following Embick (2007), Shwayder (2015) that local dislocation can take place when the first complex word is spelled out, but the second one is not.²⁷ The derivation that Shwayder (2015) proposes is abstractly represented in (142).²⁸ In the first phase a morphological word is built with the context of /X/, which receives phonological information. This output then gets fed back into the syntactic structure. In the second phase, when Y is added, it can form a larger X^0 together with the already spelled-out X^0 in the first

²⁵The analysis for Turkish is in line with the one proposed by Kornfilt (1996).

²⁶This is a different version of Morphological merger (Marantz 1984, 1988) and m-merge (Matushansky 2006).

²⁷As Shwayder (2015) points out, this is similar to the phonological grouping for affixal clitics as proposed by (Selkirk 1995). However, in his system, and the system proposed here, it is not the case that certain elements are stored as a specific type of unit. Crucially, that is not possible, since in Turkish the auxiliary can be an independent word as well, and tense can be in single syntactic word with the verb in particular contexts as well.

²⁸For ease of exposition, I have omitted some of the notations which indicates if something is linearized or not. What is important for the discussion at hand is how a syntactic word can form a recursive phonological structure.

domain. This then means that both form a single syntactic and phonological word, but there is a separate phonological unit inside of this.

(142) Local dislocation with Interleaved Phonology (Shwayder 2015, p.211)

1. Phase 1: Just X

Morphosyntactic Structure [X]_{x⁰}

Phonological Grouping (/X/)_ω Where /X/ is the phonological
exponent of X's vocabulary item

2. Phase 2: Y is added

Morphosyntactic Structure [(/X/)_ω]_{x⁰} [Y]_{x⁰}

Local Dislocation [(/X/)_ω Y]_{x⁰}

Phonological Grouping ((/X/)_ω /Y/)_ω

What is important here is that local dislocation takes place after the first X⁰ is phonologically interpreted, i.e., spelled out already. I assume that at the point where phonological grouping takes place, phonological rules can apply, such as stress and vowel harmony, and not just VI-insertion takes place. The derivation for Turkish is as follows, for (143), repeated from above.

(143) a. ((kal¹iyor) du)

b. [[kal -Iyor] **DI**]
 stay -PROG PST
 'was staying'

In the first phase the morphosyntactic structure of the V+Asp complex is built through head movement. Since it contains aspect, the verb-word can be interpreted at phonology as well: vocabulary insertion takes place, and stress and vowel harmony apply. I assume that stress can take place because the information that there was a lexical root is still visible at this point. This is what has been discussed in the previous section as well and is represented in (144). The whole phonological form is then part of the complex head without any internal structure.

(144) 1. Phase 1 = Asp Turkish

Morphosyntactic Structure

a. Head movement [[[V] v] Asp(+PROG)]_{ASP(+PROG)}b. Removal [[[V]] Asp(+PROG)]_{ASP(+PROG)}

Phonological grouping

c. vocabulary insertion [[/kal/]_V] /Iyor/]_{ASP(+PROG)}d. stress assignment [(/kal'Iyor/)_ω]_{ASP(+PROG)}e. vowel harmony [(/kal'iyor/)_ω]_{ASP(+PROG)}

When the second phase gets sent to spell-out, T cannot move to the verb, since T requires a host of a root-type. Since the verb only has phonological material, it is not an appropriate host. Thus, to rescue T an auxiliary is inserted. Local dislocation can take place optionally after this operation. After this the phonological grouping takes place, at first the vocabulary items are inserted. Stress assignment does not take place because there is no lexical root anymore: the phonological grouping of the first phase has already taken place and there is no internal structure present anymore. After all phonological information is in, I assume that the auxiliary can be deleted, since it occurs between two consonants, (139b). Note that this rule does not have to apply in case of (140b), because in this case the default form (the glide) is inserted and none of the other phonological requirements are met. Vowel harmony can take place, and I assume that it spreads from the last vowel onto the next, in this case the vowel in the past tense. This derivation is summarized in (145).

(145) 2. Phase 2 Turkish

Morphosyntactic structure

- | | |
|------------------------|--|
| a. Auxiliary insertion | $[(/kal'iyor/)_{\omega}]_{ASP(+PROG)} [AUX T]_T$ |
| b. Local dislocation | $[(/kal'iyor/)_{\omega} AUX T]_T$ |

Phonological grouping

- | | |
|-------------------------|---|
| c. Vocabulary Insertion | $[(/kal'iyor/)_{\omega} /y/ /DI/]_T$ |
| d. Stress | n/a |
| e. Auxiliary form | $[((/kal'iyor/)_{\omega} /DI/)_{\omega}]_T$ |
| f. Vowel Harmony | $((/kal'iyor/)_{\omega} /du/)_{\omega}$ |

The same analysis holds for Japanese. This was also discussed in Sec. 2.1.1, where the auxiliary takes over the pitch of the last syllable of the verb-word. The data is repeated in (REPjpnmismatch) for an accented and an unaccented verb. In this case there are two syntactic units, the main verb and the auxiliary. The pitch contour ends on the last syllable of the main verb, the progressive morpheme. The auxiliary and the tense morpheme do not have a pitch contour of their own, but rather, they take over the pitch of the last syllable: with unaccented verbs this is H, with accented verbs this is L.

- (146) a. i. ((L H H H H) H H)
me si a ga te i ru

- ii. [mesiaga -te] [i -ru]
eat -PROG AUX -PRS
's/he is eating'

- b. i. ((L H H L) L L)
he da ta te i ru

- ii. [hedata -te] [i -ru]
be.distant -PROG AUX -PRS
's/he is becoming distant'

I assume that this is similarly analyzed to the Turkish cases above: when the morphosyntactic word is built in the first phase (V plus Asp), the pitch contour is assigned. This output is put back into the syntax and can be referenced in the second phase. When word formation in the second phase takes place, an auxiliary is inserted and local dislocation takes place. Vocabulary insertion happens

(optionally deleting the auxiliary). There is element that requires a specific pitch contour, and to assign pitch to the auxiliary the pitch of the last syllable can spread onto the remaining syllables. This is summarized in (147) for the unaccented verb, The only difference with the accented verb is that the spreading is L rather than H.

(147) a. 1. Phase 1 = Asp Japanese

Morphosyntactic Structure	
a. Head movement	$[[[V] v] \text{ Asp(+PROG) }]_{\text{ASP(+PROG)}}$
b. Pruning	$[[[V]] \text{ Asp(+PROG) }]_{\text{ASP(+PROG)}}$
Phonological grouping	
c. Vocabulary insertion	$[[/\text{mesiaga/ }]_V /te/]_{\text{ASP(+PROG)}}$
d. Pitch contour	L H H H H $[(/\text{mesiagate/ })_\omega]_{\text{ASP(+PROG)}}$

b. 2. Phase 2

Morphosyntactic Structure	
a. Auxiliary insertion	L H H H H $[(/\text{mesiagate/ })_\omega]_{\text{ASP(+PROG)}}$ [AUX T] _T
b. Local Dislocation	L H H H H $[(/\text{mesiagate/ })_\omega \text{ AUX T }]_T$
Phonological Grouping	
c. Vocabulary insertion	L H H H H $[(/\text{mesiagate/ })_\omega /i/ /ta/]_T$
d. Pitch Contour	n/a
e. Pitch Spreading	L H H H H H H $(/\text{mesiagate/ })_\omega /ita/_\omega)$

In Turkish it seems that the local dislocation option is optional, even though speakers, especially younger generations (Kornfilt 1996) seem to prefer the locally dislocated form of the verb. In Japanese the rule is not optional, but what is optional is the deletion of the auxiliary: even with the full auxiliary there is spreading of pitch. A question that arises at this point why there are two

operations that form words in the second domain: there is auxiliary insertion and there is local dislocation. It would be conceivable to only have one rule. Moreover, local dislocation here is not an operation that satisfies a syntactic requirement where inflectional features that need to be hosted by a root, this is already satisfied by the auxiliary. In Japanese it could be argued that there is a pitch requirement which cannot be satisfied by the auxiliary, but this is not necessarily known at the point in the derivation where local dislocation takes place. Moreover, in Turkish there is really no such requirement at all since the auxiliary can form a single vowel harmony domain by itself. Maybe this type of operation is in fact reflecting a stage in language change where tense morphemes are turning into affixes for synthetic verb forms but this is not fully settled yet. This might also relate back to the other movement operation discussed in the previous section: I assumed that tense can move in synthetic verb form in the previous section. However, this occurred when neither of the complex heads were spelled out, and satisfied a requirement for a certain head. Local dislocation in this section happens at a different stage in the derivation where the first syntactic word is already interpreted in the phonology. A question for future research is why a language can have both options, and how this possibly relates to the status of the features being expressed by tense and the phase head. This will also be discussed in the next chapter.

2.4 Conclusion

This chapter investigated verbal paradigms of two languages usually classified as agglutinating. I have shown that, by carefully investigating the phonology and syntax of various verbal morphemes that there systematic patterns with regard to word hood. Crucially, which morphemes behave like a single syntactic and phonological unit with the verb depend on the nature of the morpheme (root or bound element) and the specific feature combinations. I have also shown that with regard to combinations of functional morphemes there is a split with regard to morphemes expressing features below viewpoint aspect and above: those below viewpoint aspect markers can combine into a single syntactic word, whereas features above viewpoint aspect cannot combine inside a single syntactic

head.

I have proposed an analysis where viewpoint aspect counts as a phase head, following various proposals that have argued for aspect as a phase. This phase head can be removed when it is not specified for any features, to derive simple tense forms. Second, I have argued that even though syntactic words map onto phonological words, it is possible to create larger phonological words. I have proposed that this is done via a version of local dislocation.

This proposal makes various predictions which will be explored in the next chapters. First of all, I made a distinction between creating syntactic heads and larger phonological words. The interactions of these different types of word-building processes are explored in the next chapter. Specifically, since I have only looked at head final languages, how it is possible to determine what type of head movement is present in the language. Second, since I assume that periphrasis is derived through phases, it makes predictions how auxiliaries pattern with other phenomena that have been argued to be sensitive to phases. In this regard, it is also important to explore the simple tenses where the phase head gets removed in the morphology, but not in the syntax. It should be expected that the phase should still be visible in the syntax in these cases. This will be explored in chapter 4, together with various other proposals that deal with periphrasis. Finally, I argued that the content of the morphemes matter: I make a distinction as to which categories count as phases. This distinction should be visible in cross-linguistics variation with regard to auxiliary patterns as well. This variation in what inflectional material can and cannot be grouped inside a single syntactic word will be explored in Chapter 5.

3

Words and head movement

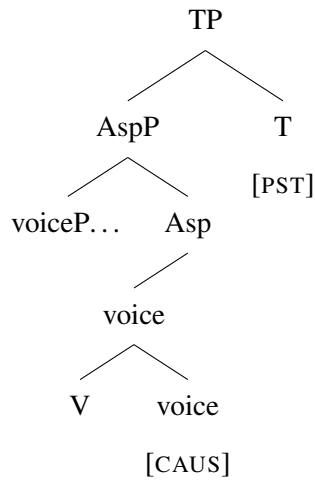
The previous chapter dealt with a puzzle in two head-final agglutinating languages, Japanese and Turkish. An example is repeated in (1) for Turkish, where in some words different phonological and syntactic processes pick out the same unit, (1a), whereas in other cases the processes do not align, (1b): syntax and stress pick out the unit including the verb and the aspectual marker, whereas vowel harmony picks out all morphemes, including the tense marker. In other words, there is a bigger word-unit for vowel harmony than for stress, and stress can fall in the middle of this bigger unit. I have shown, based on various phonological and syntactic tests that there are in fact two syntactic words present in cases where the phonological processes do not align.

- (1) a. i. (koş -**tur** -'du)
 ● → → →
 ii. [koş -**DUr** -**DI**]
 run -CAUS -PST
 'x made y run' (based on Kornfilt 1997, 331)
- b. i. ((konuş -'ur) -**du**)
 ● → → →
 ii. [[konuş -**Ar**] [y -**DI**]
 speak -HAB AUX -PST
 's/he used to speak' (Based on Kabak and Vogel 2001, 323)

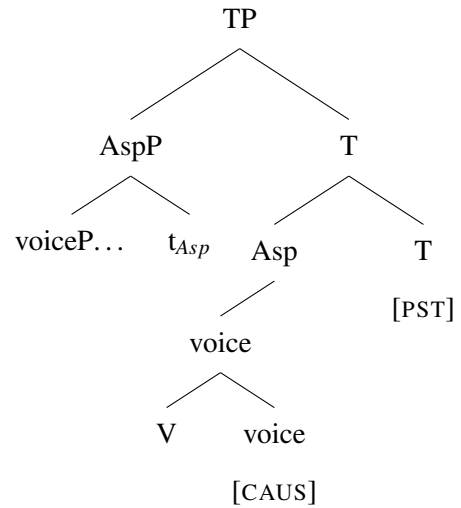
In order to account for the difference in vowel harmony and stress, I argued that there are multiple ways of building a word: one that is built in the syntax and is sensitive to overt phase heads, one that is built in the morphology, and one that can apply after vocabulary insertion of the main verb. The interaction of marked phase heads and movement can create synthetic verb forms, (2), and periphrastic verb forms, (3). For synthetic forms there is a two step derivation, in which there are two units in the syntax, but a single unit in the morphology and phonology, which means that phonological processes can only pick out a single unit and all align, (2). In case of periphrasis, word-building operation at the morphological and phonological level fails, leaving certain heads stranded, and auxiliaries can be inserted in the morphology, (3b). Finally, in case of two units in the morphology and phonology, there is a word-building mechanism that can re-create a single phonological unit, through a form of local dislocation, (4). I argued that this process takes place after the main verb is phonologically interpreted, i.e. it has received stress and vowel harmony. Local dislocation can move the auxiliary onto the phonological form of the main verb, and vowel harmony spreads through the auxiliary. This means that in this case the output of the first operation which created a periphrastic construction, can be partially masked in the phonology.

(2) Synthetic verb form

a. Syntax

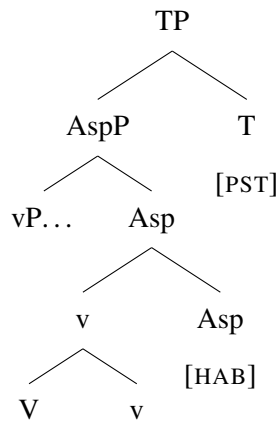


b. Morphology

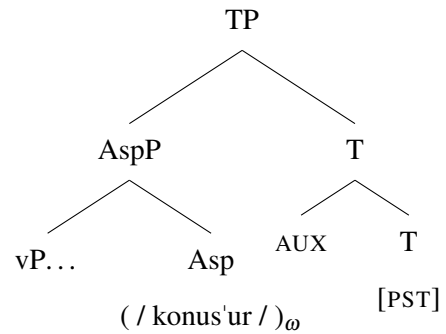


(3) Periphrastic verb form

a. Syntax



b. Morphology



(4) Syntax-Phonology mismatched verb form

$$[(/konus'ur/)_\omega] [AUX T] \Rightarrow [(/konus'ur/)_\omega AUX -T] \Rightarrow ((/konus'ur/)_\omega du)_\omega$$

There are two major assumptions in this proposal that will be discussed, worked out, and

tested in this and the following chapter. The first assumption has to do with the alternation between periphrasis and synthesis and the phase head. I have shown that it is possible to derive the alternation between periphrasis and synthesis in Turkish and Japanese as a result of the presence or absence of an overt phase head. That is, it depends on the presence of the aspectual head in a complex head if a synthetic verb form can be built or not. I argued in the previous chapter that phases can block word-formation, which creates a periphrastic construction, leaving certain heads stranded. It has been shown in the literature that the formation of a synthetic or a periphrastic verb form is indeed sensitive to the feature content of the morphemes that need to be combined (Bjorkman 2011, Pietraszko 2017). However, there is a discussion in the literature whether periphrasis is indeed the result of failed head movement, and what this mechanism of creating periphrasis is. The proposal made here and the other proposals in the literature make different predictions with regard to variation in expected auxiliary patterns cross-linguistically, and to what extent the periphrastic-synthetic alternation correlates with other phenomena in the language. These predictions will be discussed in more detail in the next two chapters, which focus on phase theory (Ch. 4) and cross-linguistic variation (Ch. 5).

Before these theories can be discussed with regard to auxiliary patterns, it is important to focus on the other major assumption from this proposal, namely the word-formation processes. These assumptions are explored in this chapter: what is the typology of word-formation processes, and how is it possible to test the the timing of head movement. The proposal made in the previous chapter argued that head movement (the word-formation procedure that is sensitive to phases) takes places during spell-out, and not before. This option exist in the literature, but it is definitely not the only location proposed for head movement. Sec. 3.1 focuses on discussing the various options. I assume that there is a single movement operation which can apply at different stages of the derivation. Specifically, I assume that in the syntax there is a choice and languages differ in whether head movement applies before or after Spell-Out. This leads to various different outputs, for example in languages like English and Turkish versus languages like Greek or French. Moreover, this also means that verbs can be built in a single phase, or in two phase-cycles. I provide in Sec. 3.2

a way to test this assumption by looking at other phenomena than word-building. Then, moving in the morphology or phonology creates various mismatches, similar to those discussed for Japanese and Turkish in the previous chapter. I provide additional evidence for these predictions in Sec. 3.3 and 3.4. Thus, first of all, I show assuming word-building at these steps in the derivation leads to variation which will be discussed in detail. Second, after giving a typology of surface forms I provide additional evidence by looking at various predictions in relation to movement, such as identity requirements of verbs and verbal elements in specific ellipsis constructions. Crucially, in the process of providing evidence for several of the assumptions, I show how this can be done also for languages where this has been hard to do, namely head-final languages such as Turkish and Japanese.

3.1 Typology of movement and predictions

The proposal in the previous chapter is that phases block head movement, and that head movement can take place after material is sent to spell-out. However, this is not the only option that has been proposed for the location of head movement: there are also theories that assume that head movement in fact can extend phases (den Dikken 2007, Gallego and Uriagereka 2007a,c), and that there are word-building operations that take place in the morphology (various options are Affix hopping, Morphological Merger or Lowering, Chomsky 1957, Lasnik 1981, Marantz 1984, 1988, Pollock 1989, Halle and Marantz 1993, Bobaljik 1994, Lasnik 1995b, Embick and Noyer 2001, a.o.), and after or during vocabulary insertion (Local Dislocation, Embick and Noyer 2001, Embick 2007, Shwayder 2015). This chapter explores the possibility that all these operations are of the same type —merge two heads together—, but that the timing of these operations lead to various different outcomes, and as such can interact with other operations in the grammar at different times. Thus, I explore the option that there is a single head movement operation that applies at different times: before or after spell-out, and before or after vocabulary insertion. This idea is in line with a group of proposals that argue that head movement does not happen at a single point in the derivation, (Rizzi

and Roberts 1989, Matushansky 2006, Harizanov 2014, Harizanov and Griбанова 2019).¹

I assume that movement happens because certain heads require a host of a particular type. One way this can be resolved is by moving the root to the next head. Crucially, when movement is not possible, this requirement is satisfied in a different way, for example by the insertion of an auxiliary. Crucially, there is a morphological operation inside complex heads that can interact with movement and the next phase, which is the removal of unmarked heads.²

I show in this chapter how these various options derive different synthetic, periphrasis and movement patterns. Crucially, this theory also makes predictions about various other syntactic, morphological, and phonological operations. That is, the different timing of movement should correlate with other properties that only indirectly deal with movement. This will be explored in this chapter as well.

In order to see the theory at work and its implications, this section is divided into two subsections. The first deals with operations available in the first phase.³ As argued in the previous chapter, I assume that head movement interacts with phases, and as such I first show how the operations work here. This leads to four different outcomes, based on how the movement operations interact. These outcomes can be complete, i.e. have a phonological interpretation, but do not have to. That is, certain outputs of the first phase are only completed at a later stage in the derivation. The four different options will be discussed in the following subsection, which deals with the second phase.

¹I assume that head movement in this sense is a single operation, but because it applies at different points in the derivation it needs to obey different locality restrictions, and applies to different units (syntactic or phonological units). However, it might still mean that there are different operations to account for phenomena that have been argued to be head movement. One such operation, I assume is movement to C (see Sec. 3.1.2 where I follow Nilsen 2003, Müller 2004, Wiklund et al. 2007, 2009). Thus, I differ in assuming that all head movement is in PF (Chomsky 2001, Schoorlemmer and Temmerman 2012, Platzack 2013) or is in the syntax and can or cannot be reduced to a different type of operation (Koopman and Szabolcsi 2000, Harley 2004, Roberts 2010a, Starke 2018, Baunaz and Lander 2018, Arregi and Pietraszko 2019a).

²It might be the case that structure removal, just as word-building proposed here, is an operation that applies at various points in the derivation, but have different outcomes that are due to the part of grammar it applies to. See Müller (2017, 2018), and the papers in Murphy (2019) for relevant ideas and references to structure-removal operations in syntax.

³I use the terms phase and cycle interchangeable. Thus cycle here refers to a syntactic, and not a morpho-phonological cycle

3.1.1 The First Phase

I assume that in the first cycle head movement is available, and there is a choice between head movement applying before spell-out (HM<SO) or after spell-out (HM>SO), which is option [A.] in the following list, (5). For now I assume that head movement only happens when there is at least a root or lexical element available (Cinque 2005).⁴ When head movement takes place before spell-out, it can pass phase heads, and in effect can lead to phase extension (den Dikken 2007, Gallego and Uriagereka 2007a,c). The proposal in this dissertation is that when the order is that the first step is that the phase is sent to spell-out, head movement is blocked by phases.⁵ This is the same operation in syntax, and as such I assume that the locality constraint is a version of the Head Movement Constraint (Koopman 1984, Travis 1984, Baker 1985, 1988) However, since the timing is slightly different I assume that the direction can be different: when head movement takes place before spell-out, the direction is upwards since this is syntax, (Koopman 1984, Travis 1984, Baker 1985, 1988, Roberts 2010a). However, when it takes place after Spell-Out the direction can be either up or down (following Harizanov and Gribanova 2019, Arregi and Pietraszko 2019a). I assume that once complex heads are built, morphological operations can apply. The relevant operation that interacts with the movement operations here is the removal of unmarked heads (which can be modeled as pruning Embick 2010 or obliteration Arregi and Nevins 2007).⁶ For now I assume 'unmarked' to be those heads that do not have a feature value, and leave open if this refers to minus values of a binary system or not (see Calabrese 2011 for arguments why minus values could be marked). Crucially, this operation does not distinguish between phase and non-phase heads, but the output leads to different results. That is, I propose that this removal operation also applies to

⁴See the following section for how I deal with T-C movement, and movement to C in general.

⁵A way to think about this is the distinction that is made for overt versus covert movement (Huang 1982, a.o.), where covert movement happens during LF and does not have any influence on the phonological form, but does have an effect on meaning. I do not call movement after spell-out PF-movement, since I show that a distinction must be made between different steps during PF and there are various types of movement present. However, this type of movement, due to its timing, does not have any influence on meaning. The only type of movement in the system here that potentially can have an influence on meaning is movement that happens before spell-out.

⁶Removal is represented in the structures as if the terminal node is removed. However, it might be the case that the whole node is removed, and that the node 'docks' onto the first higher head, following Calabrese (2019), to create larger feature bundles (instead of a head movement structure with separate heads). See also footnote 7 and the discussion on docking in Sec. 3.1.2.3.

unmarked phase heads, and when it does, the complex head cannot be interpreted in the phonology and this complex head is fed back into the syntax for the second cycle. When there is a phase head present, the complex head can be interpreted by the phonology and a phonological word is fed back into the syntax.

The summary in (5) gives all the relevant assumptions, the underlined assumptions are those that I propose.

(5) Assumptions first cycle

A. Syntax: Order of Head Movement (HM) and Spell-Out (SO)

A1. HM<SO (Koopman 1984, Travis 1984, Baker 1985, 1988, Roberts 2010a)

- * Can pass phases (phase extension) (den Dikken 2007, Gallego and Uriagereka 2007c.a)
- * Direction is upwards (Koopman 1984, Travis 1984, Baker 1985, 1988, Roberts 2010a)
- * Locality: Head Movement Constraint (Koopman 1984, Travis 1984, Baker 1985, 1988)

A2. HM>SO (Chomsky 2001, Schoorlemmer and Temmerman 2012, Platzack 2013)

- * Blocked by phases (= the spell-out domain)
- * Direction can be up or down (Harizanov and Gribanova 2019, Arregi and Pietraszko 2019a)
- * Locality: Head Movement Constraint (Koopman 1984, Travis 1984, Baker 1985, 1988)

B. Morphology: removal of unmarked heads (Embick 2010, Arregi and Nevins 2007)

B2,4. Unmarked phase heads are removed, complex head stays in syntax

B1,3. Marked phase heads indicate the complex head can be sent to phonology

C. Phonology: Vocabulary insertion (Halle and Marantz 1993, a.o.)

These assumptions and the steps of the derivation are given in the following table 3.1. This chart should be read as follows. There is an underlying structure in the syntax, where there is a phase boundary above y , indicating that y is the phase head, x is the stem. For ease of exposition the structure only has a single head outside of the first phase. The first option a grammar can make is whether there is head movement before or after spell-out, represented in A1-A2. As discussed

above, when there is head movement before spell-out this can lead to phase sliding, making z the phase head in [A1]. All this material can then be sent to spell-out, since zP is the phase boundary. In case of [A2], first material gets sent to spell-out, which is all the material inside the phase yP . After this head movement takes place, and in effect the complex head that is formed stops at the phase head. After this, in the morphology all unmarked phase heads are removed, which applies to any complex head. Since the head movement option in [A] leads to two options, now there are four logical possibilities, shown in [B1-B4]. This means that for those derivations where the phase head is marked, [B1] and [B3], the phase head remains in the complex head, but the phase gets removed in the morphology when it is unmarked, [B2] and [B4].⁷ Finally, in the phonology only the complex heads that have a marked phase head are interpreted, [C1] and [C3]. For these two complex heads vocabulary insertion takes place and phonological processes apply. When there is no phase head present anymore, [B2] and [B4], the structure is not interpreted in the phonology and the complex head remains in the syntax. This is indicated in [C2-C4] with ‘...’ that indicate no change in the derivation has taken place.

⁷ The option to [B2-C2] is represented as a dotted line, because it is not clear if this should be a logical possibility. The questions here are what counts as ‘marked’, and what is the trigger for movement before spell-out, and if it must mean that in order for phase extension to take place, the head that attracts the verb is in fact always marked. Put differently, it is not clear if phase extension is the possibility when there are no unmarked heads. For example, in much of the literature on V-to-T movement in the Rich Agreement literature (Roberts 1985, Kosmeijer 1986, Platzack and Holmberg 1989, Pollock 1989, Holmberg and Platzack 1995, Rohrbacher 1994, Vikner 1995, Koenenman 2000, Koenenman and Zeijlstra 2014, Tvica 2017, but see Iatridou 1990, Bobaljik and Thráinsson 1998, Harbour 2016 and Heycock and Wallenberg 2013 for differing views), there is a reasoning that movement is only possible, or triggered, by marked agreement paradigms. However, as Schifano (2015, 2018) shows, it is not the case that agreement can be the only trigger for this, since she compares Romance languages that have different heights for the verb, but all are languages with a ‘rich’ paradigm for agreement. For her, following Biberauer and Roberts (2010), Roberts (2010a), the richness in fact comes from the amount of Tense, Mood, and/or Aspect morphology a language has. I leave for future work what the trigger is for movement, and if and how this bears on the question of markedness (see also Bjorkman 2011 for ideas on markedness and movement).

Cycle 1

Syntax

Morphology

Phonology

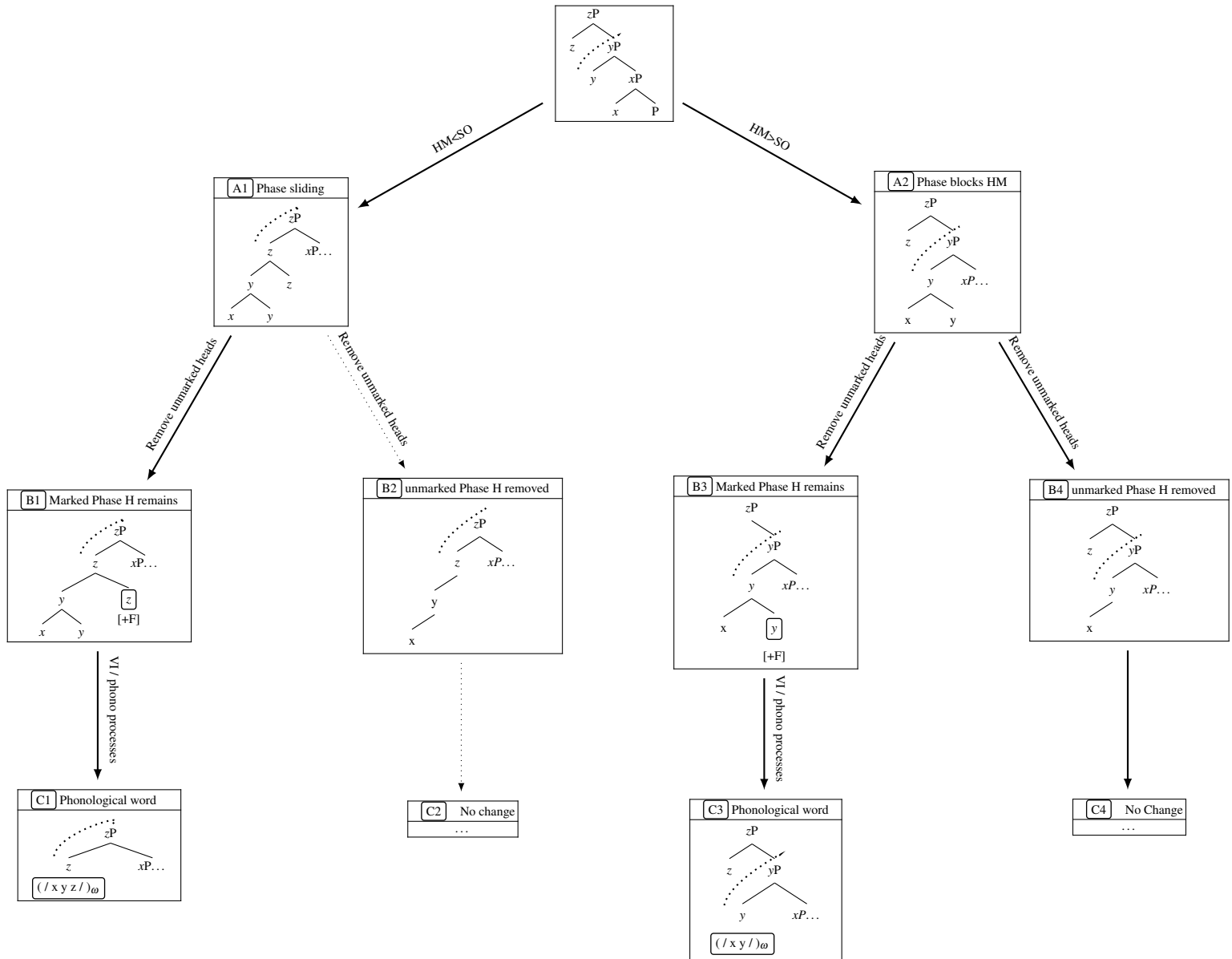


Table 3.1: First cycle operations

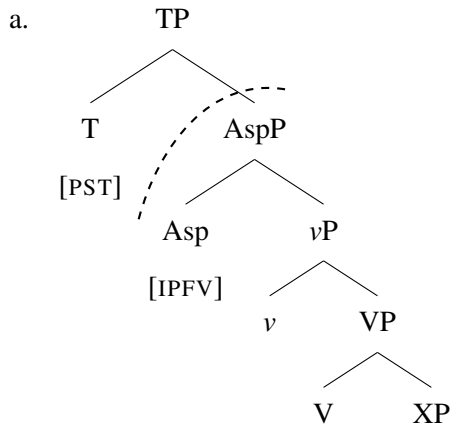
Before discussing how the outputs of this first cycle lead to various outcomes in the second cycle, I discuss a couple of examples. As mentioned in footnote 7, the question is if the option of moving the verb before spell-out B2, and not having a marked phase head is a possibility or not because of the nature of phase extension. For this reason I do not discuss it here.

Putting this option aside, I will illustrate an instantiation of A1-B1-C1 with a synthetic form in Greek, the option A2-B3-C3 with a periphrastic form in English, and the option A2-B4-C4 with a synthetic form in English. The forms are given in (6). Since I will be illustrating only the steps of the first cycle, not all forms will be fully derived yet, specifically the derivation for English simple tenses. The full form will be derived in the next section, which crucially makes predictions that are different from Greek. These predictions will be pointed out.

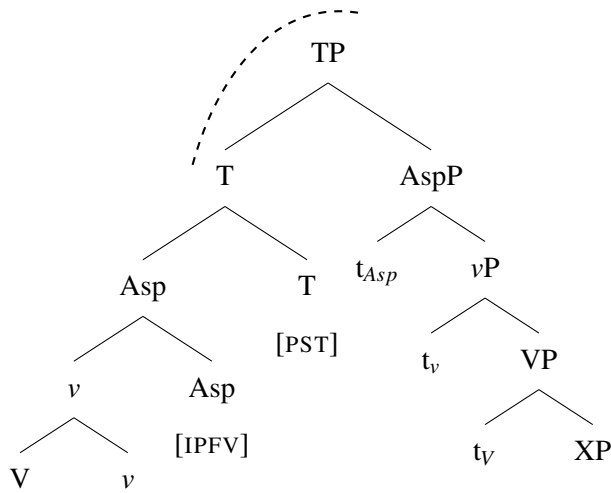
- (6) a. [$\acute{\epsilon}$ -tro -a]
 PST -eat.IPFV -1.SG.PST
 ‘I was eating / I used to eat’ [Greek]
- b. walk-ed [English]
- c. was walk-ing [English]

First, the derivation for Greek is given. The syntactic structure is shown in (7a). The phase head is above the aspectual head, and both tense and aspect are marked for a feature specification (following Aelbrecht 2010, Harwood 2013, 2015, Aelbrecht and Harwood 2015, Wurmbrand 2017 that aspect is a phase head). Then, the first step is head movement (A1 in table 1), and this leads to phase sliding. In Greek the first head outside of the phase is the landing site of the verb, (7b). This phase then gets sent to spell-out. At this point morphological operations apply, which means that all unmarked heads are removed. In this case only v gets removed, (7c). Since the phase head is present, the complex heads gets interpreted in the phonology, and the phonological word gets fed back into the syntax, (7d).

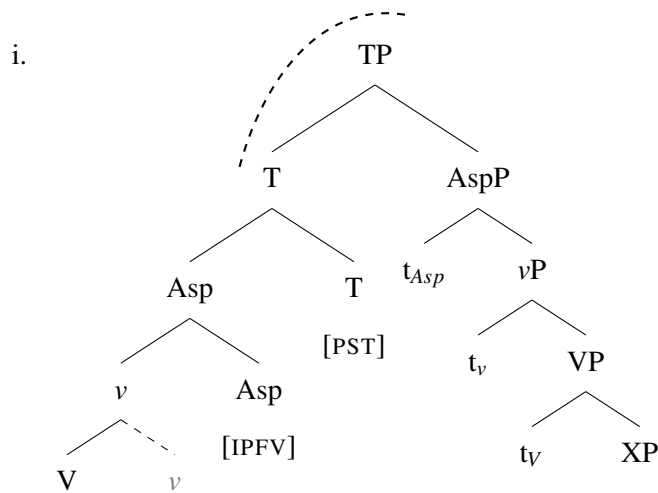
(7) A1>B1>C1: Greek synthetic tense

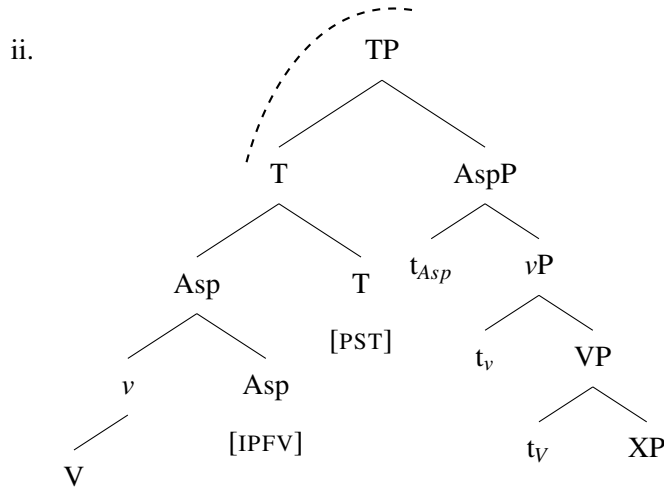


b. Head Movement, A1

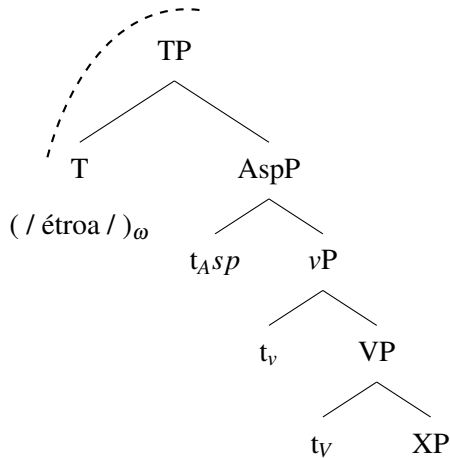


c. Removal, B1





d. Phonological Word, C1

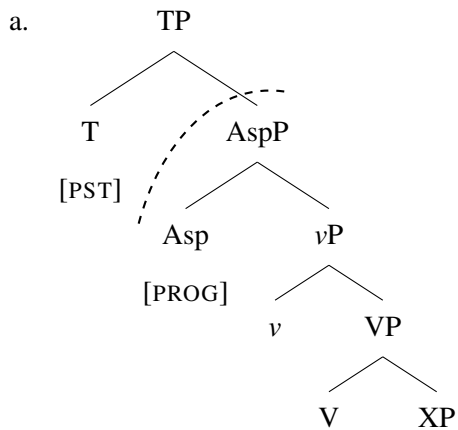


This means that the result after the first cycle in Greek is that the verb, aspect, and tense, end up in a single syntactic, morphological, and phonological word. This will crucially be different in the two other examples for head movement after spell-out.

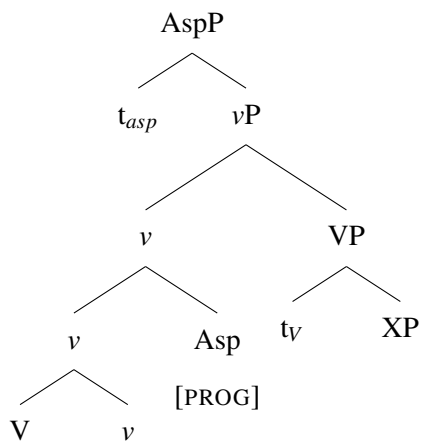
The A2>B3>C3 case is only different in the timing of head movement, but has still a marked phase head. English periphrastic tenses are an illustration of a case where head movement applies after spell-out, and the complex head gets interpreted in the phonology because the phasal head is present, (32). Other than the first step of head movement, the derivation is identical to Greek synthetic tenses. The only difference between Greek and English here is the fact that Greek has an additional step of head movement which applies before spell-out, and as such has more heads in the initial stage in the complex head. The derivation is presented below. In the first step, the phase is sent to spell out and head movement stops at the phase head, Asp[+prog]. Since head movement

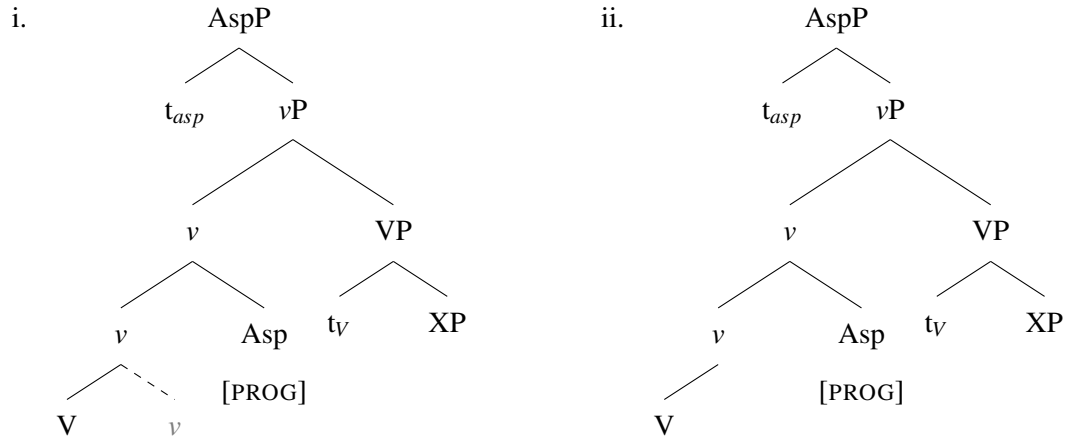
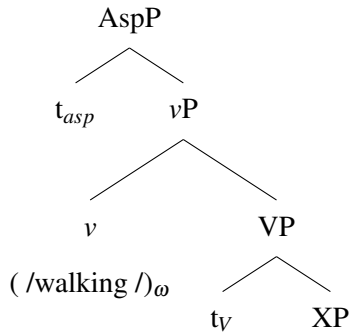
happens after spell-out, recall that I assume that the direction for head movement can be up or down. It has been argued that in English (and some of its varieties) there is head movement of V out of its base position but below T (Johnson 1991, Bošković 1997, Lasnik 1999, McCloskey 2000, a.o.). This is represented here as movement to *v*, and I leave open the option that the verb moves to Asp. When unmarked heads are removed, (8c), the phase head remains which means that this complex head gets interpreted in the phonology, (8d).

(8) A2>B3>C3: English Periphrastic Tense



b. Head Movement, A2

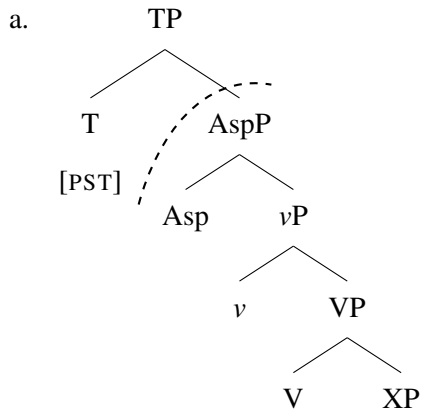


c. Removal, B3d. Phonological word, C3

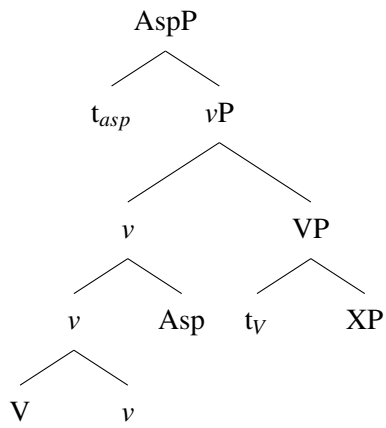
To summarize, there is in both English periphrastic tenses and Greek synthetic tenses a phonological word, because there is a marked phase head. The difference is that the phase head is different, which leads to different material in both phonological words.

Finally, there is an additional difference that leads to a different output. A synthetic tense form in English is an instantiation of the steps in Table 1 of A2>B4>C4. Crucially, the first step is the same as in English periphrastic tenses, A2, (9b). The first phase gets sent to spell-out, and head movement takes place, creating a complex head including V, *v* and Asp. The difference between the cases in Greek and English discussed so far, and the derivation here is that the phase head, Asp, is unmarked and will thus get removed in the morphology, (9c). This means that the complex head will not be interpreted in the phonology, and what gets fed back into the second cycle is a complex head, (9d).

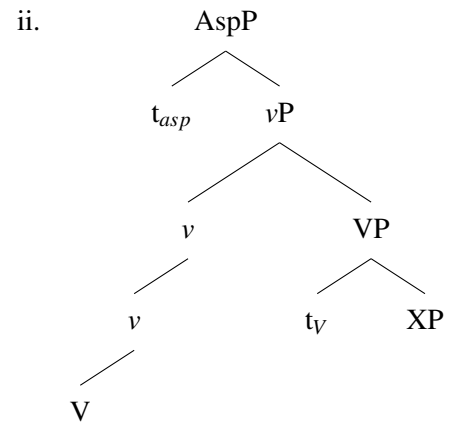
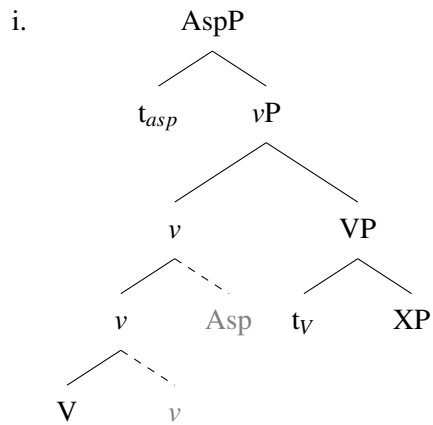
(9) A2>B4>C4: English synthetic tense

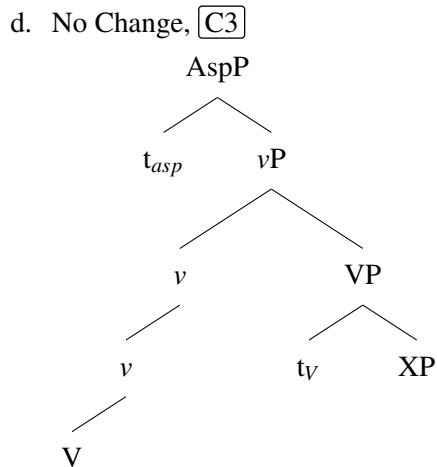


b. Head Movement, A2



c. Removal, B3





This result of this derivation is that there is only a complex head present, and no phonological word. Thus, even in synthetic tenses the tense head remains outside of the verb form. The result after the first cycle in English is that Tense does not end up in the same complex head in syntax, morphology, or phonology; this is similar for the periphrastic and the synthetic cases. The difference between a synthetic and periphrastic form is the fact that in the periphrastic form there is already a unit that is interpreted in the phonology, because there is a marked phase head. Recall that in Greek synthetic tenses the verb stem and tense do end up in the same complex head, already in the first step of the derivation. These similarities and differences make specific predictions, which will be tested later. First of all, there should be independent evidence for A1-A2. I show in Sec. 3.2 how this prediction can be tested by looking in detail at identity requirements between verbs in verb stranding ellipsis contexts. I also briefly mention other ways to test this, for example by looking at extraction and binding patterns. Second, there should be evidence for the fact that in English tense never combines with the main verb on the first cycle, whereas this is the case in languages with HM<SO. That is, there should be evidence that in the syntax synthetic and periphrastic tenses in English behave identical. I show in Sec. 3.3 how this can be tested by looking at a different type of ellipsis context and identity requirements on inflectional heads such as T, and in Chapter 4 Sec 4.2 by looking at verb fronting patterns.

Finally, I mentioned that for ease of exposition I only represented the structures in Table 1 with a single head outside of the first phase. Here I would like to point out what would happen if there

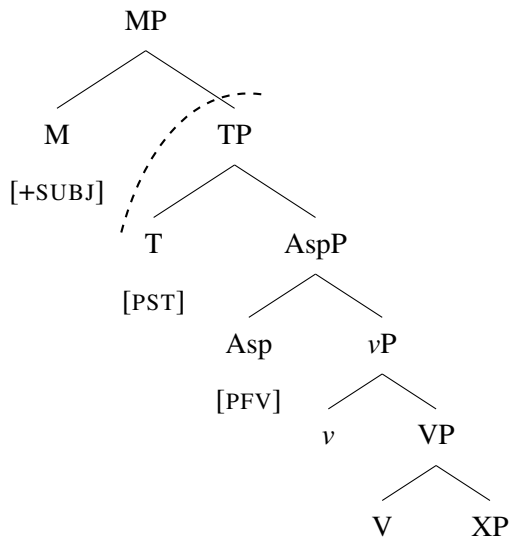
are multiple heads present. For example, I discussed a Greek synthetic tense form, where *z* is an instantiation of T, but there are also cases where Greek has remaining heads that have not been interpreted in the first phase. I assumed that the requirement of verb movement is the first head outside of the first phase, i.e. *z*. This means that if there are heads higher than the first head, they should be only interpreted in the second cycle and should behave similar to the output of C3: a case where there is a phonological word in the first cycle, and remaining syntactic heads in the higher cycle. The Future or the Subjunctive would be such a case in Greek: The output of the first cycle is a phonological word including Asp/T, and the Mood/Modality heads remain outside of the first phase, since they are not the first head above the first phase. The initial stage of the derivation in the first cycle and the final stage is given in (11).

(10) A1>B1>C1 with multiple heads: Greek Mood

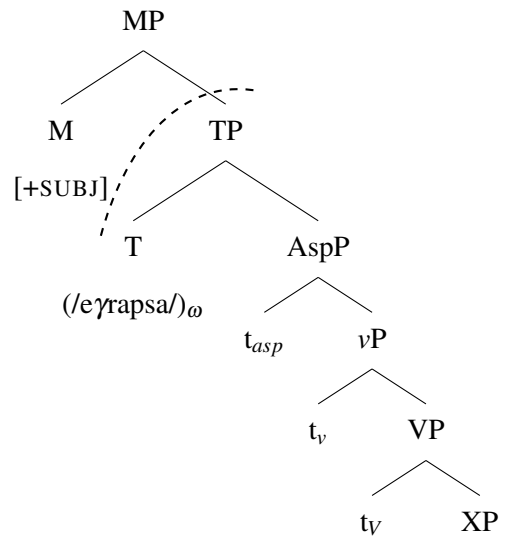
[na= [e- γραψα]
 SUBJ PST write.PFV
 ‘I should write it’

(Roussou and Tsangalidis 2010, p.48)

(11) a. Initial Stage



b. Final Stage



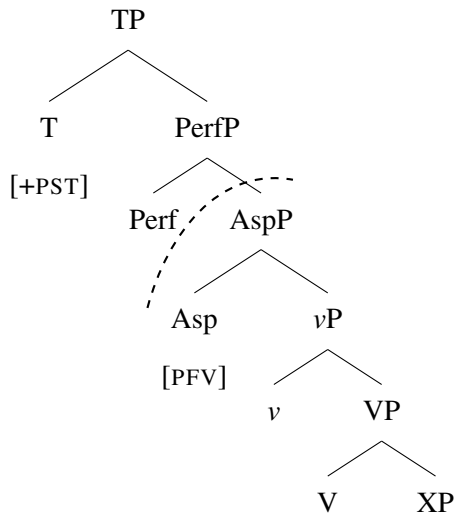
A different case would be a case where there is a head in between T and the phase head Asp, namely Perf (Comrie 1976, Dahl 1985, Iatridou et al. 2003, Pancheva 2003, Pancheva and von Stechow 2004, Rothstein 2008). This structure plays a role in both English and Greek, but they

have different outcomes after the first cycle. For Greek this means the following. Perf, being the first head outside of the phase is z , and is included in the first phase when the verb moves to the first head outside of the first phase. This is represented in (13). This complex head is then spelled out on the first cycle, and only T remains not interpreted.

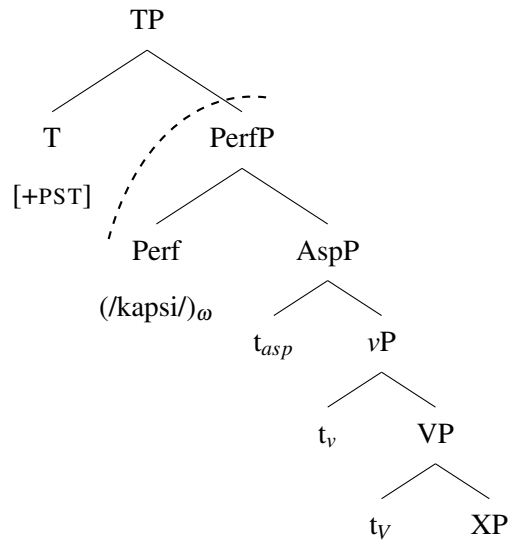
(12) $\boxed{A1>B1>C1}$ with multiple heads: Greek Perfect

Itan safes oti to pedhi **ixe** idhi **kapsi** epitidhes ti supa
 it.was clear that the child had.3SG already burned.PART intentionally the soup.ACC
 ‘It was clear that the child had already intentionally burned the soup’ (Merchant 2018, 232)

(13) a. Initial Stage



b. Final Stage

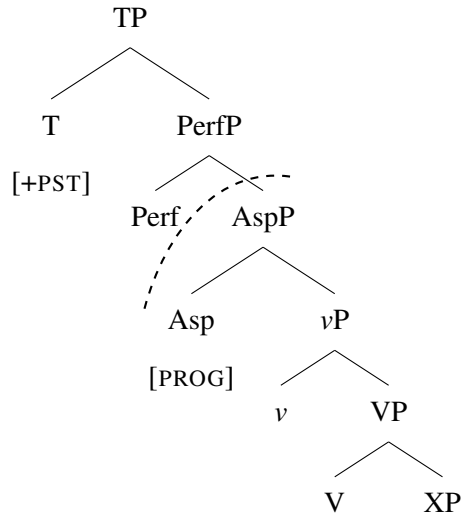


For English, the situation is slightly different. In case Asp, the phase head is marked, and the output will be one where the complex head is spelled out on the first cycle (for example with the progressive), (14). This would be the result of the derivation leading to $\boxed{C3}$. When the phase head is unmarked, following the derivation in $\boxed{C4}$, the output is one where no material is interpreted in the phonology, (15). In both cases, because head movement only takes place after spell-out, both T and Perf remain outside of the first cycle, and are not interpreted on the first cycle. This is then different from Greek, where Perf is included in the first cycle.

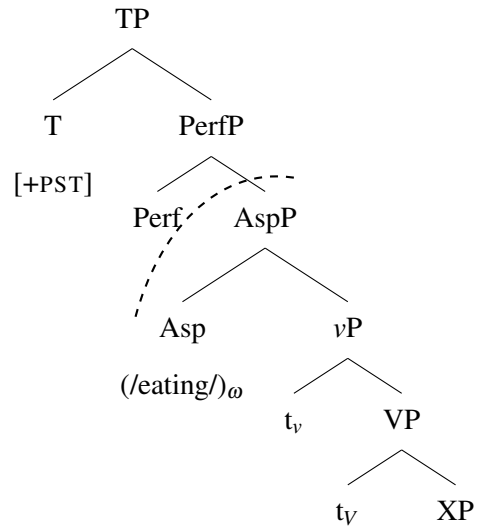
(14) A2>B3>C3 with multiple heads: English Perfect Progressive

Baby Spice [**has**] [be **-en**] [eat **-ing**] a Chupa Chup [Prog Perfect]
 B. S. AUX.PRS AUX -PRF eat -PROG a lollipop
 ‘Baby Spice has been eating a lollipop’ [English]

a. Initial Stage



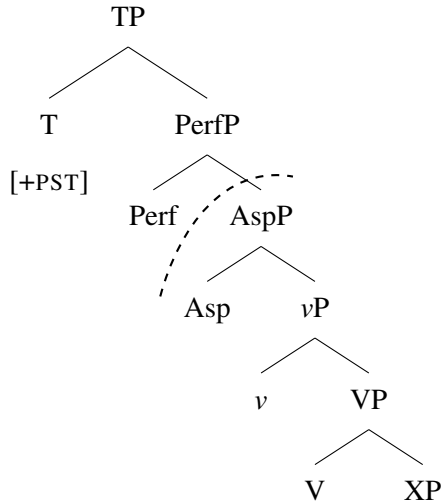
b. Final Stage



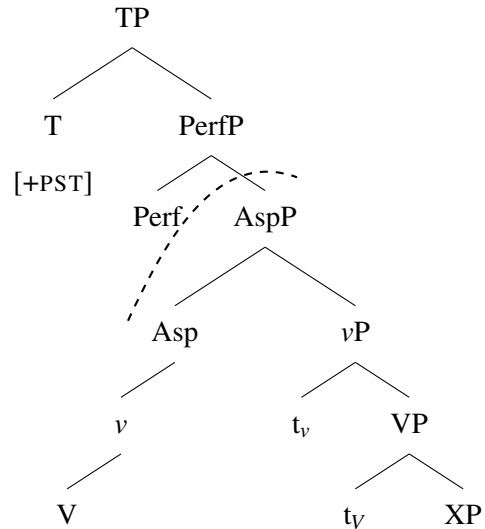
(15) A2>B4>C4 with multiple heads: English Perfect

Baby Spice [**has**] [eat -**en**] a Chupa Chup [Perfect]
 B. S. AUX.PRS eat -PRF a lollipop [English]
 ‘Baby Spice has eaten a lollipop’ [English]

a. Initial Stage



b. Final Stage



These cases of having multiple heads make specific predictions. First of all, with regard to identity requirements for inflectional heads in ellipsis: When heads are not interpreted in the first cycle, the identity patterns should be identical as for English tenses. That is, Mood in (11) and T in (13) should behave identical, in Greek, and in English Perf should also behave like T. Second, the verb in the perfect moves to a different height in Greek and in English. This is also visible in the examples above, with regard to adverb placement. This will be discussed in more detail in Sections 3.1.2.3, 3.1.2.4, and 3.3.2.

To summarize, I used two different timings of moving heads: before and after spell-out. I proposed that when head movement is timed after spell-out, it cannot cross phase boundaries. This, combined with the operation that unmarked heads get removed in the morphology in complex heads leads to four (maybe three) different outcomes. I assumed that the head movement operation is the same for both timings, but since they occur at different times, they lead to different outcomes in how inflectional heads are grouped together. Moreover, I hinted that this distinction makes predictions

for various other phenomena, which will be discussed in more detail in Sec. 3.2-3.4 in this chapter and Sec. 4.2 in chapter 4.

3.1.2 The Second Phase

The output of the first cycle yields different results, given in the table below. The first two outputs do not have any remaining heads: either all the heads form a phonological word, [C1], or form a complex head, [C2]. The latter two outputs are more complex. The output [C3] has a phonological word spelled out in the first cycle, and there are remaining heads present; [C4] has multiple complex heads. These outputs are fed back into the syntax and can be manipulated in the second cycle. Since there will be multiple options for each of these outputs, they are discussed in separate subsections.

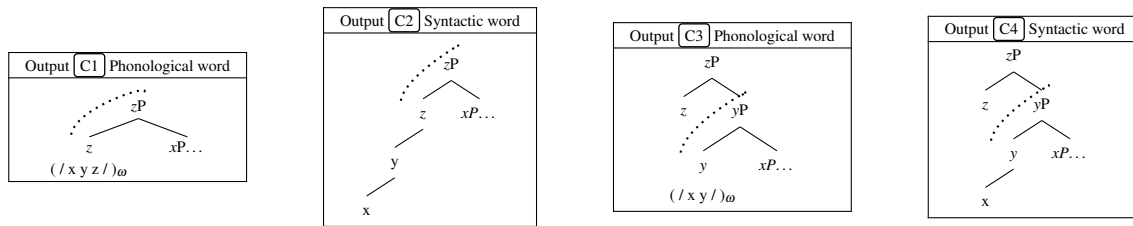


Table 3.2: Output First Phase operations

Recall that even though [C3] is presented here as the output of head movement after spell-out with a marked phase head, the same structure can be the output of head movement before spell-out with a marked phase head as well. This was discussed in relation to the Perfect and Mood in Greek and English, thus when in cases when there are more heads in the second cycle. The reason this was not presented in the table in the previous section, but only discussed below the derivations, is because the table started with a structure with only one head outside of the first phase. When discussing the possibilities for [C3] this will be discussed in more detail what the relevant phenomena are. Second, I also mentioned that [C2] might not be an option the system generates, because phase extension might only be possible when the head that the phase gets extended to will always be marked. However, I will briefly discuss this option and what the pattern might look like.

Several points will be important when discussing the second cycles. These assumptions are

summarized in (16), and the assumption I propose are underlined.

(16) Assumptions Second Cycle

D. Syntax: Movement

D1. Movement to C (Nilsen 2003, Müller 2004, Wiklund et al. 2007, 2009)

- * Leads to T-C or V2 effects (den Besten 1983, Roberts 1993, Biberauer and Roberts 2016, a.o.)
- * Can be with X^0 or ω (Truckenbrodt 2006, Platzack 2013)

D2. Head movement is not available

E. Morphology: Repairs (Bjorkman 2011, Calabrese 2011, 2019)

- Move (Chomsky 1957, Lasnik 1981, Marantz 1984, 1988, Pollock 1989, Halle and Marantz 1993, Bobaljik 1994, Lasnik 1995b, Embick and Noyer 2001, Matushansky 2006, Vicente 2007)
 - * Locality: Adjacency (Marantz 1984, 1988, Embick and Noyer 2001, Matushansky 2006, Vicente 2007)
 - * creates syntax-morphology mismatches
- Dummy Auxiliary insertion (Bach 1967, Embick 2000, Cowper 2010, Bjorkman 2011, Arregi and Klecha 2015, Pietraszko 2017)

F. Phonology: moving and interpreting (Halle and Marantz 1993, Embick and Noyer 2001)

- Move (Embick and Noyer 2001, Embick 2007, Shwayder 2015)
 - * Locality: Linear Adjacency? (Embick and Noyer 2001, Embick 2007, Shwayder 2015)
 - * Creates syntax-phonology mismatches
- Vocabulary Insertion (Halle and Marantz 1993, a.o.)

First of all, I assume that head movement as an operation is not available anymore.⁸ For most of the cases that will be discussed this can be ruled out independently, and follow from the assumption

⁸This assumption might not be necessary. If movement that creates larger morphological units only happens when there is a root present (Cinque 2005), in most cases movement in the second phase is not possible in any case. In some cases there is a phonological word, which means there is no root present anymore, $\overline{[C1, C3]}$. In this case the heads in the higher phase cannot move because they do not have a root, and thus an auxiliary is needed. That is, the only place where head movement would be visible, is in a case where there are several complex heads still present in the syntax, i.e., output $\overline{[C4]}$. Empirically it seems only one step of head movement possible. This can be enforced, as is done in this section, by assuming that it is morphological movement and that syntactic head movement is not available anymore. Another option would be one where head movement is possible, but there is only one step possible because of the combination of removal of unmarked heads and docking of this head (Calabrese 2019, and see also the discussion in Sec. 3.1.2.3). When the phase head, being unmarked, gets removed, the head docks onto the first head up. This

discussed for the first cycle that heads cannot combine through roll-up movement if there is no root or lexical element. Thus, head movement, creating complex heads through roll-up movement is an operation that is privileged to the first cycle. It can, as in the case of phase extension, seem like it ends up in the second cycle, but it only makes the first cycle larger. Second, I assume that movement to C (such as T-C inversion in English and V2 in Germanic languages) is a different type of movement than head-to-head roll up movement. This is based on the observations that movement to C leads, in such instances at least, to replacement, rather than morphological extension (a.o Abels 2003), and can have interpretive effects (Hooper and Thompson 1973, Andersson 1975, Iatridou and Kroch 1992, Heycock 2005). To this end this type of movement can be modeled in various different ways, such as phrasal movement, or movement triggered by prosody (Nilsen 2003, Müller 2004, Wiklund et al. 2007, 2009, Roberts 2010a, Griбанова and Mikkelsen 2018), and not as head movement (den Besten 1983, Haider and Prinzhorn 1986, Platzack 1986, Holmberg 1986, Zwart 1993, 1997, Travis 1994, Vikner 1995, Holmberg and Platzack 1995). I leave the exact operation for future research. In discussing the derivations for the second cycle, I will give all the outcomes for a derivation with C, and all the options without. The focus in this dissertation is on derivations without a specified C involved, and most of the discussion will focus on these derivations. I leave the specifics for movement to C and the variation for further research. Third, morphological operations, \boxed{E} , that are not needed in the first cycle, because head movement is available, are introduced in this section. Since head movement is not available in this cycle, two morphological operations are relevant here, which have to do with heads that need to be affixal, and as such require a morphological host. These operations are auxiliary insertion and movement (operations such as affix hopping, Chomsky 1957, morphological merger, Marantz 1984, 1988, Matushansky 2006, or lowering in terms of Embick and Noyer 2001). Crucially, the movement in

creates a head in T with a larger feature bundle, and in this case this head can be spelled out as a fused morpheme, and is thus different than actual movement which creates an hierarchical structure. This fused head with the phase head and the higher head (with features) then can move and combine with the verb in the second phase. This head will not be removed, since it is marked. Crucially, since it contains a marked phase head, it can be interpreted in the phonology and no other heads can combine with this complex head because it has been spelled out. Thus, even if movement in the syntax in the second phase would be available, it can be derived that there is only one step of movement. I leave working out this option for future work, but see for implementation for the perfect in English the discussion Sec. 3.1.2.3

the morphology in this system can create a mismatch between syntax and morphology, in that in the syntax certain heads remain separate, but form a single unit in the morphology and phonology.

Finally, [F], before vocabulary insertion of the material in the second cycle, there is an option to move this material onto the phonological word that is already spelled out (this can be modeled as a form of local dislocation as in Embick and Noyer 2001, Embick 2007, Shwayder 2015). Thus, this is the third timing for movement of heads. Again, this option is not discussed on the first cycle, since there are never cases where there are two units, of which one has phonological content, that can be combined. This is the type of movement, as also discussed in the previous chapter for Turkish and Japanese, that creates syntax-phonology mismatches.

In the remainder of this section I focus on the four outcomes of the first cycle in turn, each in a separate subsection. As done for the first cycle I use the assumptions presented above to show abstract derivations, after which I will present empirical phenomena that fit with these derivations and discuss various predictions.

3.1.2.1 Input: Single Phonological Word

The first option that is discussed is the one where head movement takes place before spell-out, and includes all the heads present in both phases. This output will be the start of the second cycle, as shown in the table in 3.3. The table represents the derivation for the option with movement to a marked C, [D1], and a derivation without a marked C, [D2]. I discuss the derivations below the table. When the representation stays the same at a certain step, this is shown as an outcome with ‘no change’ and the ‘...’ refer to the same structure as the step before.

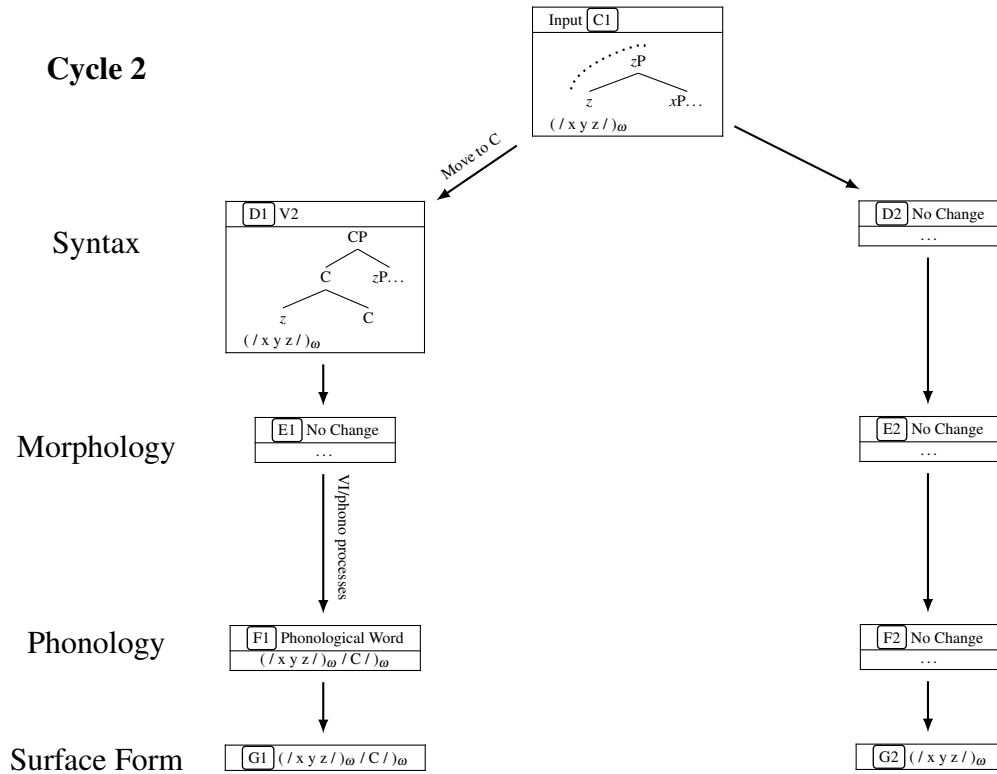
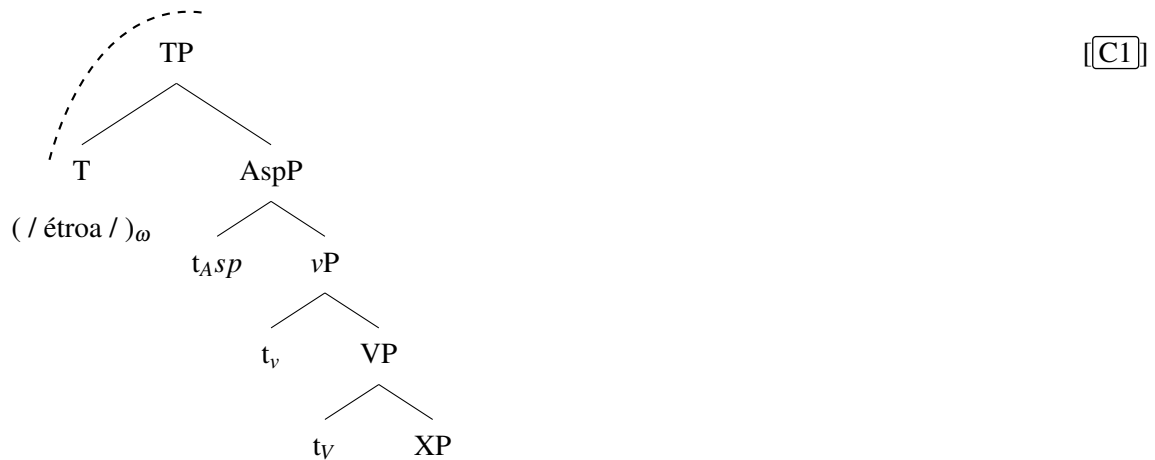


Table 3.3: Second Phase operations for phonological word after Head movement before spell-out

First, I discuss the derivation without a marked C. In this case nothing changes, and the surface form is the exact form that was already derived on the first cycle. As shown in the input for the derivation, there is only a phonological word present, and no remaining heads in the syntax. In the morphology, **E2** no operations can apply either: there are no heads that need a host by moving or inserting an auxiliary. In the phonology, **F2**, nothing happens, because there is already a phonological word. Thus, in this case the surface form, **G2** is the form already found in the first cycle. An example of this derivation would be the simple tense in Greek. The output from the first cycle is given in (17) below. Since there are no heads remaining, the output of the second cycle will still be a single phonological word for the verb, (18).

(17) $\boxed{C1>D2>E2>F2>G2}$ Greek synthetic tense(18) $(/étroa/)_\omega$ $\boxed{G2}$

For the derivation with a specified C head, there is an option of moving in the syntax, $\boxed{D1}$. I do not discuss this option in detail, but it means that C can attract a phonological word. See for discussion on the fact that syntactic movement can be fed by spelled out material among others Truckenbrodt (2006), Platzack (2013), Calabrese and Pescarini (2014), Martinović (2019). Then, as in the parallel derivation without C, there are no remaining heads in the morphology, $\boxed{E1}$. In the phonology C can be spelled out, but does not have to be, $\boxed{F1}$. Thus, the result is that either the surface form is identical to $\boxed{G2}$, or is slightly different because of the presence of C.

To summarize, the derivations for a completely spelled out complex head on the second cycle is simple: either nothing happens because there are no new heads introduced, or there is an additional step to C.

3.1.2.2 Input: Single Syntactic Word

This section briefly discusses the option where phase extension leads to a complex head without any marked heads and as such is not phonologically interpreted when the second cycle starts. The derivations are minimally different from the ones discussed in the previous subsection where there is a phonological word. The abstract derivations are given in table 3.4. Below I discuss the derivations in detail.

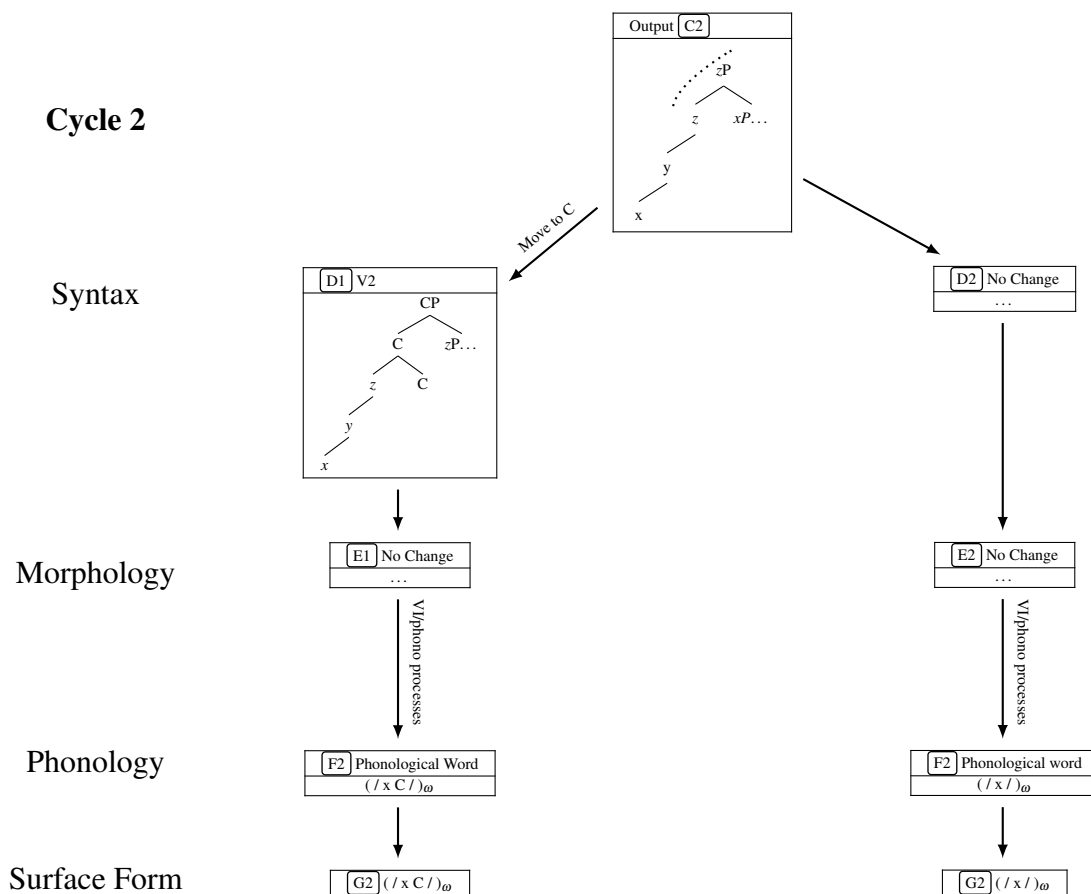


Table 3.4: Second Phase operations for morphological word after head movement before spell-out

First I discuss the option without movement to C. In this case there is a complex head that is derived from the previous cycle, and there are no remaining heads. Thus, head movement is not possible, [D2], nor are any morphological operations possible, [E2]. Since the complex head is not yet interpreted in the phonology, this happens now, [F2]. This means that the surface result is one where it is not visible that head movement, or phase extension has taken place, since the phase head is removed.

Second, with the derivation that includes C, the result is that there is the effect of V2, [D1]. The complex head moves to C, and in the morphology no altering operations take place since all heads are inside the same complex head, [E1]. As was the case for the derivation without C, a phonological word is built, [F1]. The result again is minimally different from [G2], in that C can have an effect on the phonological form. This is the same as in the derivation in the previous subsection.

I do not discuss any data here, because it is not clear what this would amount to and if this option should be allowed (see also footnote 7). Crucially, the question is if phase extension is possible without marked heads. In much on the literature on V-to-T movement the reasoning is that movement is only possible, or triggered, by ‘more marked’ paradigms (for example in the literature on the *Rich Agreement Hypothesis*, where the markedness comes from the agreement features Roberts 1985, Kosmeijer 1986, Platzack and Holmberg 1989, Pollock 1989, Holmberg and Platzack 1995, Rohrbacher 1994, Vikner 1995, Koenenman 2000, Koenenman and Zeijlstra 2014, Tvica 2017, or TMA features Biberauer and Roberts 2010, Roberts 2010a, Schifano 2015, 2018 but see Iatridou 1990, Bobaljik and Thráinsson 1998, Harbour 2016 and Heycock and Wallenberg 2013 for differing views.). If this type of syntactic movement is only possible with ‘marked’ features the derivation discussed in this section is not a possibility, since on the first cycle the syntactic/morphological word will be interpreted in the phonology. It will be interesting in future work to explore what the trigger is for movement, and if and how this bears on the question of markedness (see also Bjorkman 2011 for ideas on markedness and movement).

Up until now I discussed the simple cases, where after the first cycle no remaining heads were present. The next two subsections focus on those outputs from the first cycle that have more units present. I first focus on the output where there is no phonological word present: [C4] from the first cycle, and after this I discuss the option where there is a phonological word present and heads that remain in the syntax, [C3]. The reason is that this last option, because the output is different types of units (phonological and syntactic) leads to the most options for the second cycle.

3.1.2.3 Input: Multiple Syntactic Words

The last two inputs to be discussed are those that have more than a single unit. This section deals with the one where each of the units are of the same type: not spelled out complex heads, whereas the next section deals with units that differ between phonological and not spelled out content.

The third input for the second cycle is the one which I discussed in relation to a synthetic tense form in English: namely one where the phase head was removed in the complex head, and as such

the complex head is not yet interpreted in the phonology. The derivation is given in table 3.5. Since there are multiple units left, there are more derivations possible with this structure, especially with the movement to C options, [D1], since there are different units that can be moved; second, because here the different morphological assumptions that were discussed at the beginning of this section become relevant. Each derivation will be explained in detail below, and after this several data points will be given that represent each of these derivations.

First, as done in the previous subsections, the derivation without movement to C is discussed and the derivation of the English synthetic tense is discussed. Two issues related to empirical points will be discussed. The first is the comparison to the other synthetic tense discussed so far, namely the one in Greek. The other empirical point is the option where there are multiple heads in the second cycle, and the English progressive Perfect will be discussed. After this I discuss the derivations for movement to C in detail. The two examples of data that will be used to illustrate this are T-C inversion in English, and V2 in Dutch.

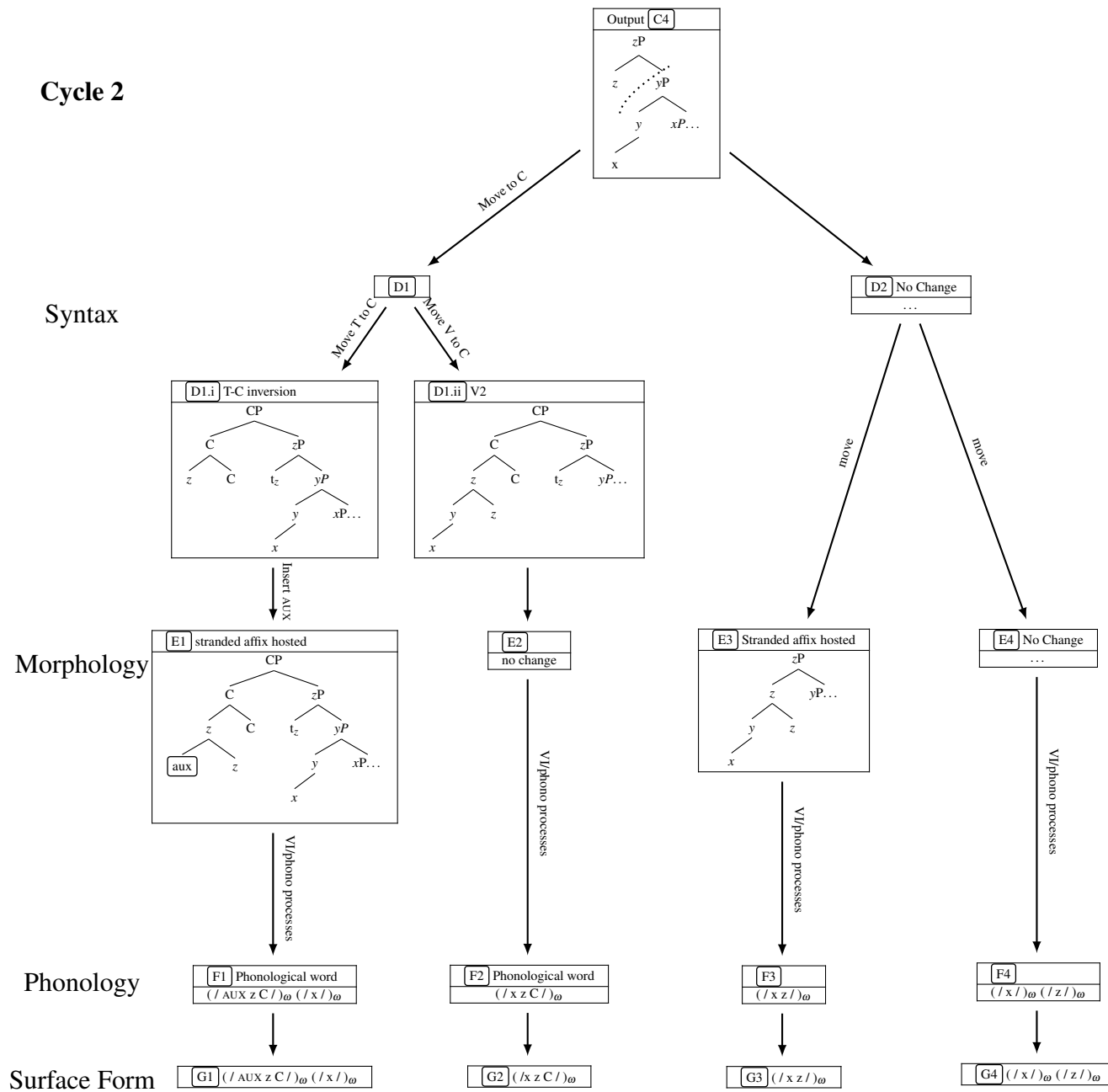
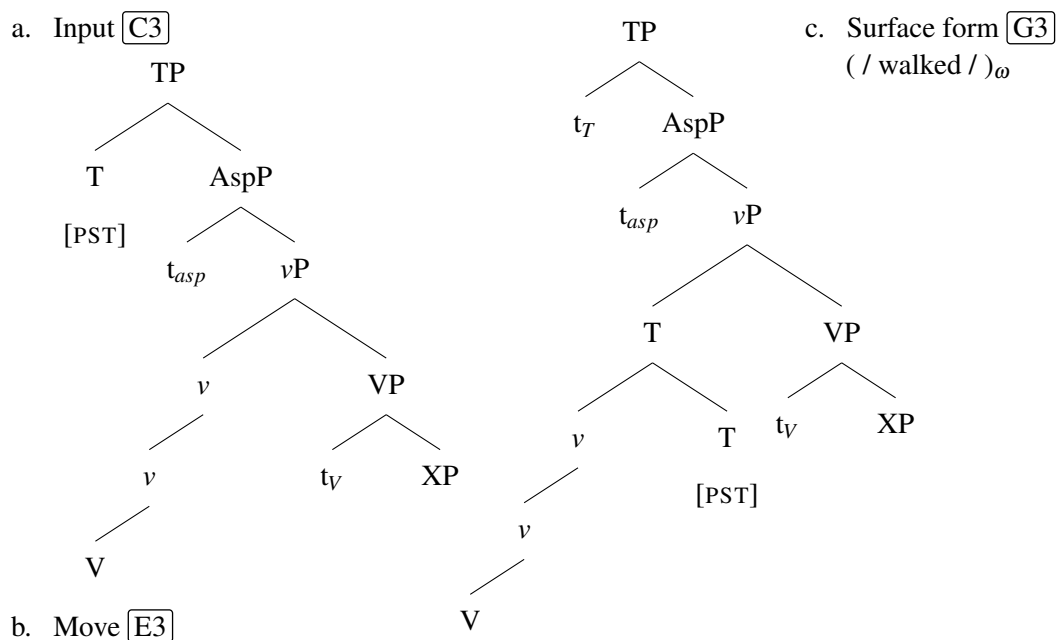


Table 3.5: Second Phase operations for complex head after head movement after spell-out

First I focus on the derivation coming out of [D2]. First of all, there is an option where nothing else happens in the morphology, [E4]. This means that z does not need a morphological host and can remain independent. The outcome, [F4-G4], is one where there are two phonological words. On the other hand there is the option of [D2-E3-F3-G3]. I assume that in the morphology z can move onto the complex head (or, since it is in the morphology, the complex head can move onto z), forming a larger complex head, [E3].⁹ I propose that this operation is ordered before auxiliary insertion, the other option in the morphology to host stranded heads (discussed below). I leave open the option if this type of movement is required because of the verb or the inflectional head. After this the complex head can be interpreted in the phonology, and the surface result is a single phonological word. Returning to English, this means that the output from the first cycle is one where T remains stranded, (19a). It can then move in the morphology, form a complex head. Since this is post-syntax, the direction is not necessarily upwards. I modeled this here as if the end position is below tense, in line with the observations regarding adverb positions Pollock (1989), Embick and Noyer (2001). However, it might well be that the verb ends up in T. See for arguments that this might be the case in relation to adverb positions, auxiliaries and ellipsis (Ochi 1999, a.o.), because adverbs can be merged a-cyclically. As soon as T is combined with the verb, which was waiting to be sent of to phonology, the complex head can be interpreted as a single phonological word, (19c).

⁹It could be that this morphological movement, or affix hopping, or morphological merger, is in fact an instantiation of movement in the syntax. But what would need to be explained then is why movement does not proceed higher, and there is only one step of movement. However, see the discussion below regarding the perfect and docking (Calabrese 2019) as an operation that docks the phase head on the next head up, and as such then sends the complex head to the interfaces after movement.

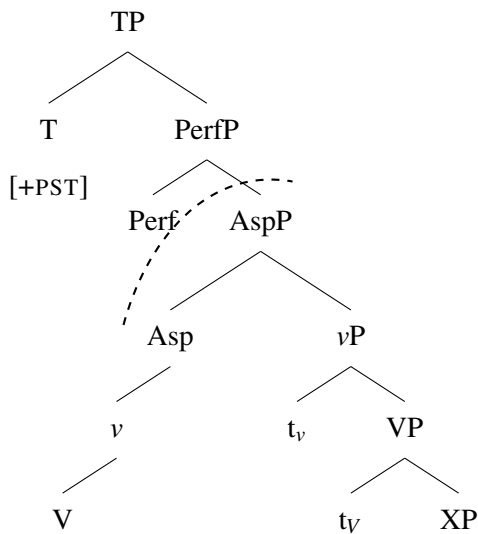
(19) D2>E3>F3>G3 English Synthetic Tense

Thus, only after the second cycle is a synthetic tense form made in a language like English. This also holds for the cases discussed in the previous chapter in relation to Turkish and Japanese. Before moving to the derivations related to movement to C, two points will be discussed. First, we are now in a position to compare the other derivation for a synthetic tense form, which was discussed in relation to Greek, in Sec. 3.1.2.1. For both English and Greek, the surface form in the phonology is a single phonological word, and even in the morphology they form a single morphological word. This means that it is predicted that both synthetic forms can behave the same in the morphology and the phonology. That is, if suppletion applies, this should be found in both languages, and for both languages there should also be evidence that there is a single phonological word. This is for example the case with stress, in both cases there is a single domain for stress assignment. This will be explored in detail in Sec. 3.4. Where these derivations differ, however, is in their history and their syntax. Recall that I pointed out that after the first cycle, the English synthetic tense is not completed, and that T remains separate in the syntax. This is not the case in a language like Greek, where already in the syntax, due to the timing of head movement, T ends up in a single unit with the verb (and aspect). This can be tested by looking at mismatches for inflectional categories in VP

ellipsis constructions and will be discussed in 3.3. The second point to be made is related to having multiple heads on the second cycle. So far, I discussed cases where there is only a single head in the second cycle available, but there are also cases in English where there are multiple heads that need to be spelled out. One such case is the Perfect, which was briefly mentioned in the discussion on the first cycle. The output of the first cycle is repeated in (21) below.

- (20) Baby Spice [**has**] [eat **-en**] a Chupa Chup [Perfect]
 B. S. AUX.PRS eat -PRF a lollipop [English]
 ‘Baby Spice has eaten a lollipop’

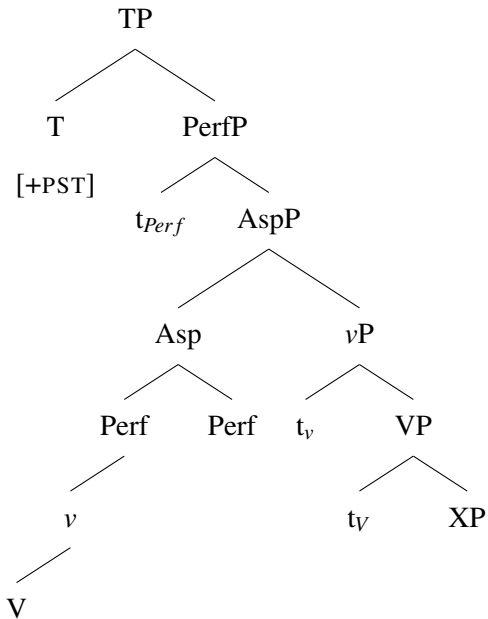
- (21) Output A2>B4>C4 with multiple heads: English Perfect



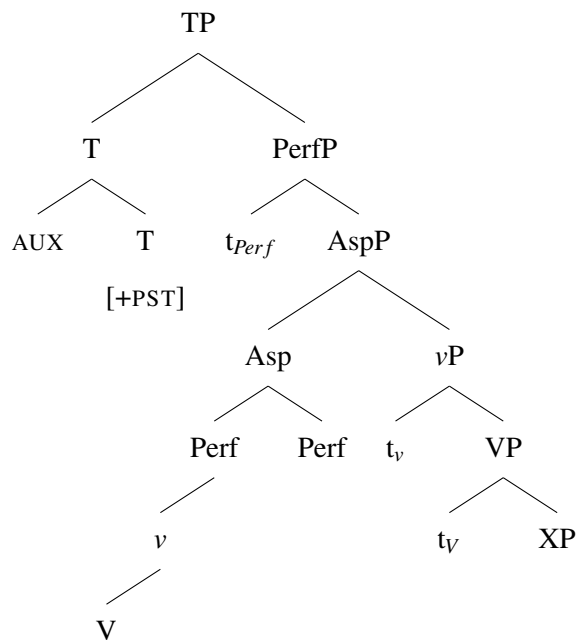
The second cycle operates as follows. As with the synthetic tense form, head movement of Perf to T is not possible, because there is no root available. Thus, head movement in the syntax does not happen. Then, in the morphology movement of Perf and the verb is possible, (22a), which then get sent to phonology. This leaves the Tense head stranded. Since there is no complex head, movement is not possible anymore, and as such the only option is to insert an auxiliary, (22b).

(22) D2>E3>F3 with multiple heads: English Perfect

a. Move



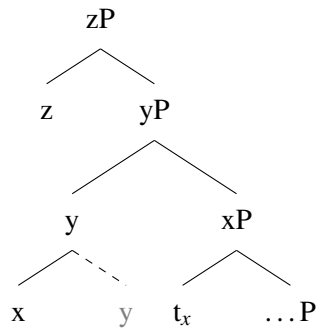
b. Aux insertion

c. (/ has /) _{ω} (/ eaten /) _{ω}

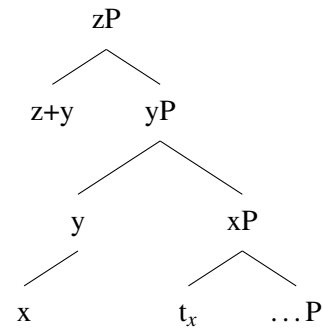
A question that might arise at this point is why only Perf can morphologically move onto the verb, but T cannot. The derivation presented in (22a) does not rule out the movement of T onto the

lower complex head. I propose that a solution to this problem is a docking operation proposed by Calabrese (2019) for removed heads. He assumes that heads that are removed need to dock onto the next head up, which creates a form of fusion. Calabrese uses this to account for the fact that semantically certain heads need to be interpreted separately, but are bundled or not present at PF. This is abstractly represented in (23).

(23) a. Remove



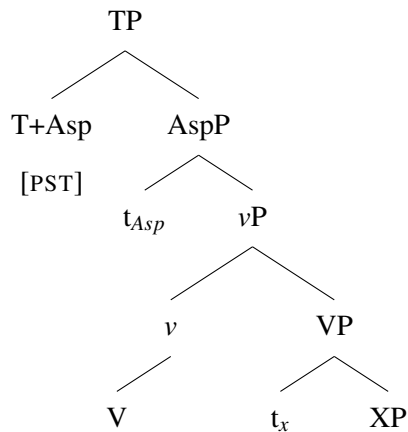
b. Docking



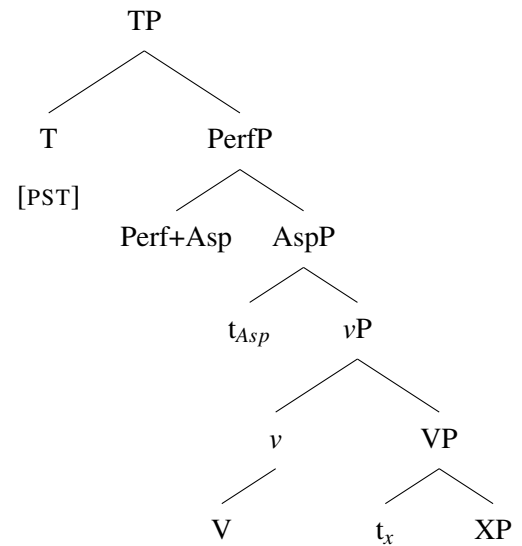
This operation creates feature bundles, and is thus different from a movement operation: it creates feature bundles that can be spelled out as a single morpheme at PF. This can be used in order to account for why only the first head outside of the first cycle can attach to the verb but no other heads. I assume that when the phase head is removed, it docks onto the first higher head—which is T in simple tenses and Perf in the Past/Present perfect. This is shown in (24), only for the docking operation, not for removing the heads. Recall that I assume that the verb ends up in v .¹⁰

¹⁰The complete derivation is one where the v also docks onto Asp when it is unmarked. Thus, the full representation would include v on the docked nodes as well, but for reasons of clarity this is omitted.

(24) a. Dock Asp to T

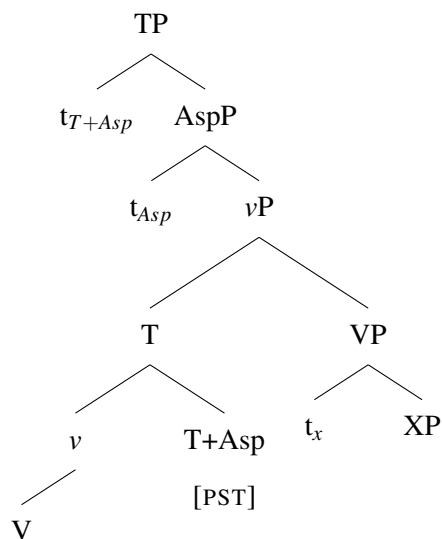


b. Dock Asp to Perf

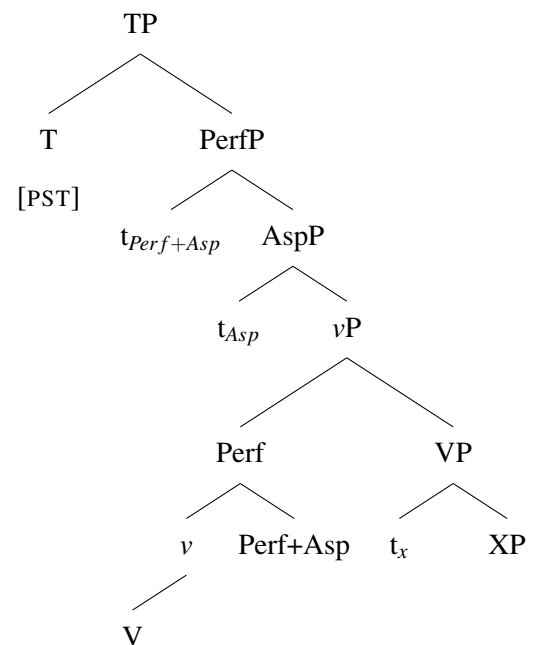


Crucially, when this head in the second cycle lowers onto the verb, the phase head is now inside the verbal complex head again, (25). That is, the verbal complex consists of a fused head which consist of the phase head, and a marked feature (T[+pst/pres] or [+Perf]).

(25) a. Move Asp+T



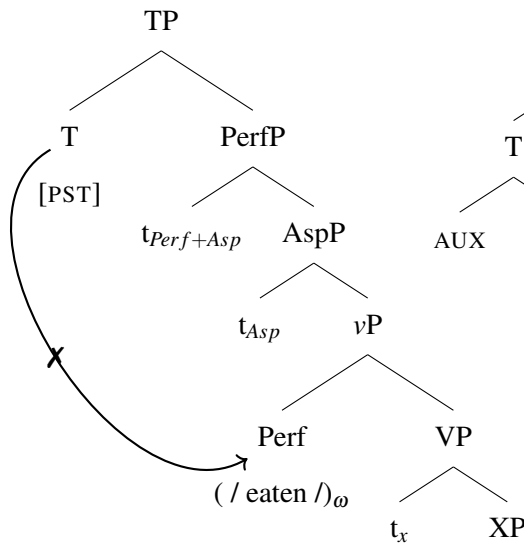
b. Move Asp+Perf



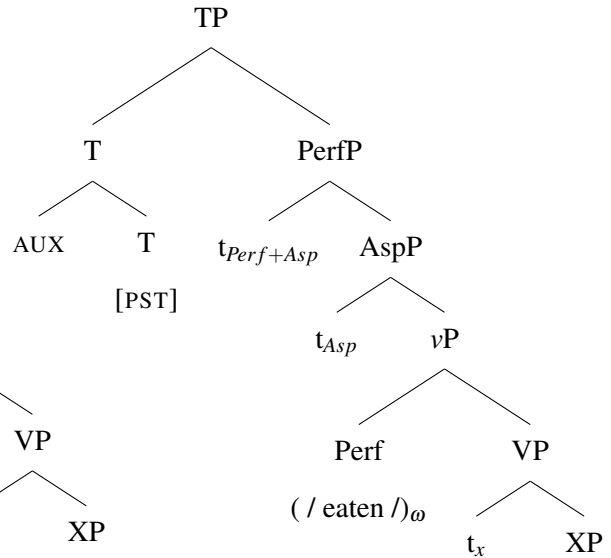
I assume that since it is fused with a marked head, this material will be sent to phonology. The morphological derivation cannot distinguish the fused phase head and the other head as two separate

heads, so for the purposes of PF interpretation it will be seen as a single head that contains a phase and a marked feature which is sufficient for phonology. In case of a simple tense nothing more happens. However, in case of the Perfect, T cannot lower onto the verb anymore since there is a phonological word and T requires at least a morphological host which contains a root. This means that in this case an auxiliary is inserted. This is summarized in (26).

(26) a. ✗ Move



b. ✓ Insert aux



Thus, the system can derive various forms, which can be synthetic or periphrastic. And, even though there are different steps in the derivations, they also make different predictions for how these elements interact with regard to different properties. Moreover, it is possible to implement a restriction on lowering multiple heads onto the verb stem by using the operation of docking after removal. This operation will effectively make the phase head share a marked feature and as such, when this head combines with the verbal complex it gets spelled out. This does not only hold in English, but also for the cases in Turkish where there are multiple auxiliaries, when there are multiple marked morphemes that need to be expressed outside of the first cycle. Moreover, this operation might be a solution to the stipulation that movement in the syntax is not possible anymore. Maybe that the morphological movement is in fact syntactic movement, but because movement with a docked phase head gets sent to spell-out, it could potentially derive that movement of higher

heads in the second phase are not possible anymore. I leave this for future work.

Before moving to the derivations with a marked C, a small note on possible data with the derivations where z is independent enough to remain separate from the verb stem. Examples of this are cases where z does not constitute an affix, but is a free morpheme. Examples in English would be mood and modal verbs, and in Japanese these are the speech act particles. Other examples would be languages that have particles to express TMA languages, such as Mandarin Chinese (Li and Thompson 1981) or the Kwa languages, such as Gungbe (Aboh and Nauze 2008).

With this in mind I return now to the derivation with C. The steps of the derivation are repeated in the table below, for ease of exposition.

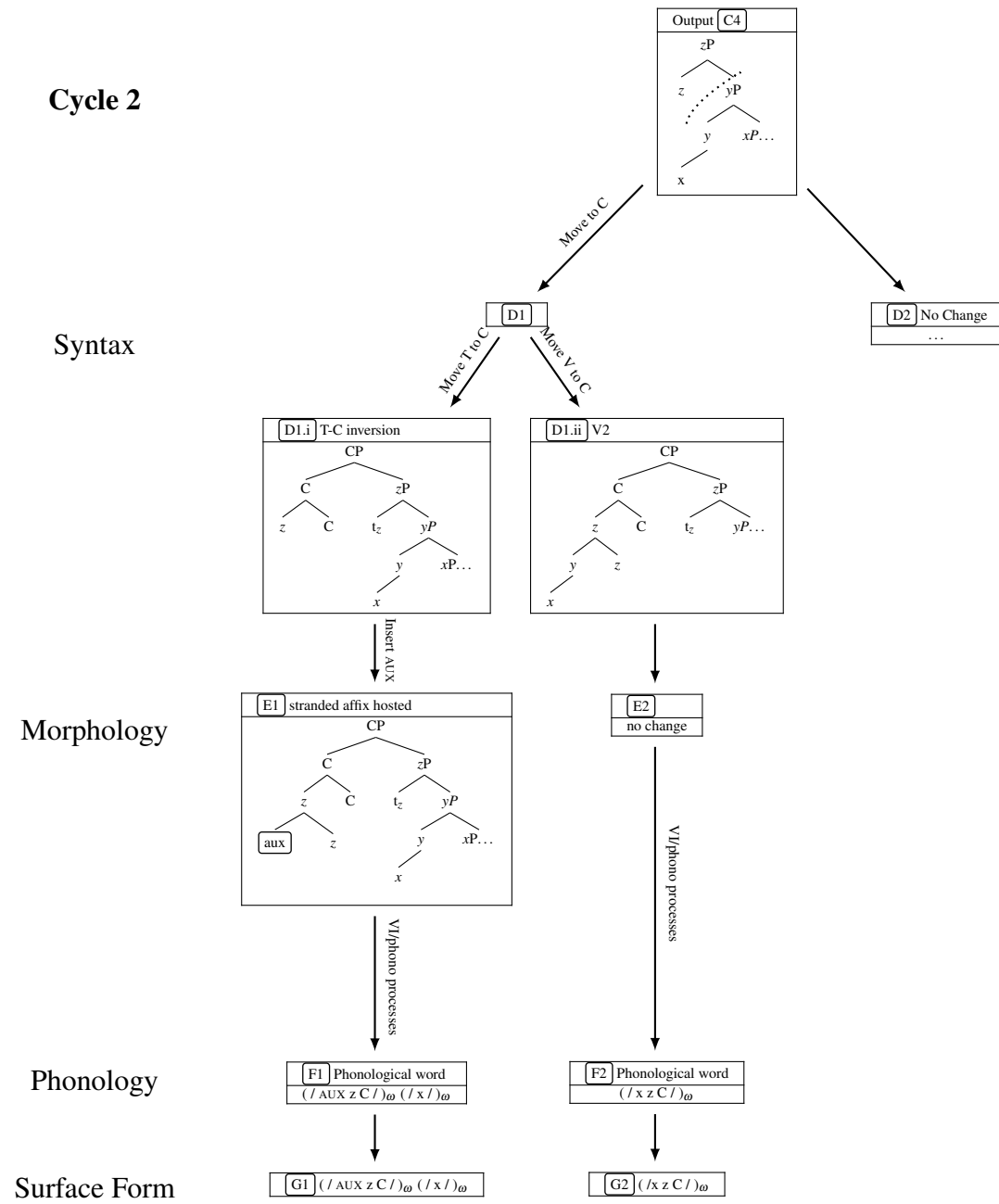


Table 3.6: Second Phase operations for complex head after head movement after spell-out

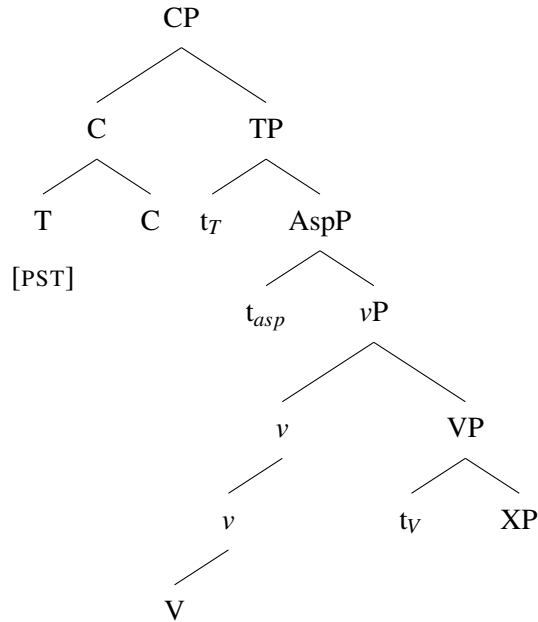
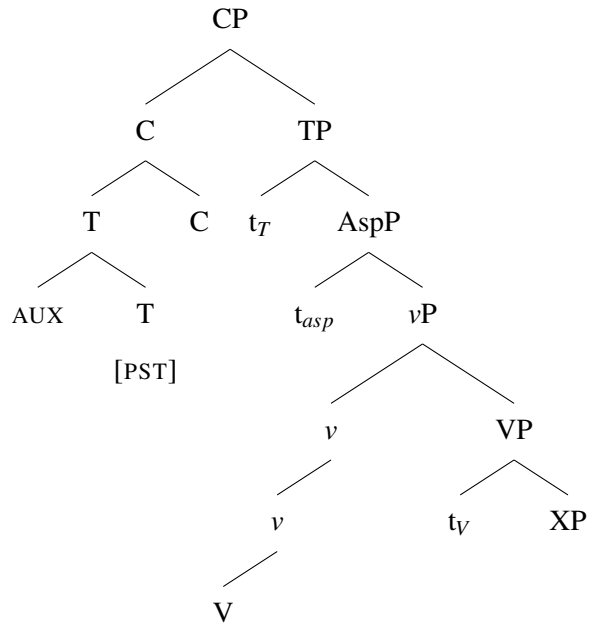
As represented in [D1] there are various options for moving to C, since there are two different complex heads available. In the first option the highest head is attracted to C, [D1.i]. As mentioned in the introduction to this section, I assume movement to C is a different type of operation (Nilsen 2003, Müller 2004, Wiklund et al. 2007, 2009), and as such it might attract a head without a root. After this happens morphological operations can apply, [E1]. In this case movement is not possible¹¹ and in order to provide these heads with a root, an auxiliary is inserted. After this VI insertion and phonological processes apply, which means that there will be two phonological words in the surface representation. An example of this would be T-C inversion in English, (27).

- (27) a. What **did** David Bowie play?
 b. *What David Bowie played?

In this case, the output of the first cycle is the same as with a synthetic tense discussed above. The difference here is that there in the second cycle is a first step of movement to C from T, before any morphological operations apply, (28a). Then, because movement is not possible, an auxiliary is inserted, (28b) and after this the two complex heads are spelled out. I assume that AUX gets spelled out as ‘do’ in context of C¹²

¹¹This is not possible under the assumption that this morphological movement needs to be local, and no interveners are possible. However, it remains an open question what the exact locality considerations for this are, and if there should be evidence for this type of movement with C, what type of evidence constitutes a morphological complex with C, T and V. It would mean that the surface result is the same for movement of V to C and the derivation under discussion here. There should then be evidence that in the syntax remain separate, whereas they are not separate in a derivation where the verb in the syntax moves to C.

¹²This could be modeled as the default spell-out of a stranded affix (Chomsky 1957, 1991, Lasnik 1981, Pollock 1989, Halle and Marantz 1993, Bobaljik 1995, Embick and Noyer 2001), but see Bjorkman (2011), Arregi and Pietraszko (2019a) for arguments against ‘do’ as a support element at PF. Since the focus in this section is on sketching the parameters made available from the starting assumptions I need for the analysis in Chapter 2 I leave the exact analysis of ‘do’ for future work.

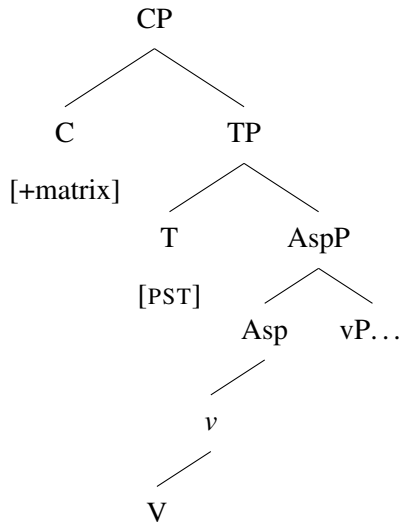
(28) D1>E1>F1: English T-C inversiona. Move D1b. Auxiliary insertion E1c. Phonological Word, F1(/ did /) _{ω} (/ play /) _{ω}

A minimally different derivation is one where it is not the highest head that gets attracted, but a

verb, [D1.ii], in which case the result is a single complex head.¹³ Since there is a single complex head, no morphological operations apply and only a single phonological word is spelled out. An example of this would be V2 in many Germanic languages, as in for example Dutch, German, Swedish, and Danish. An example is given for Dutch, where in (29) the verb is in the second position of the clause, after an adverb. The output of the first cycle is given in (30a). At the first step on the second cycle, [D1.ii] the syntactic complex including the verb moves to C. After this, in the morphology there is no change, and in the phonology this complex head gets translated into a phonological unit, [F2].

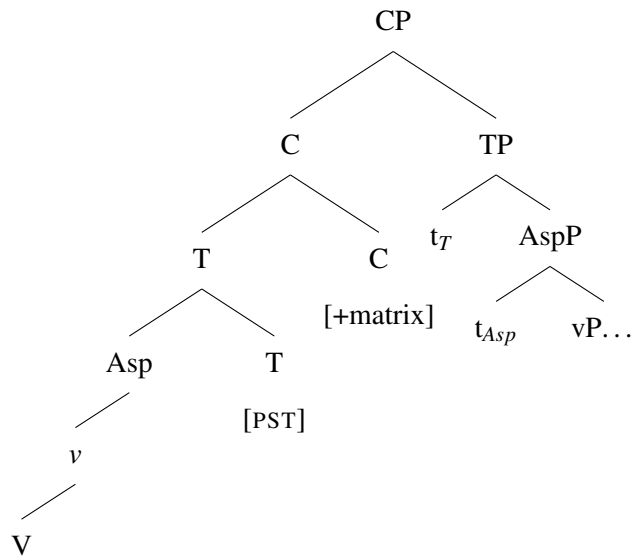
- (29) Gisteren [praat -te] Pluk met Zaza de kakkerlak
 Yesterday talk -PST Pluck with Zaza the cockroach
 ‘Yesterday Pluck talked to Zaza the cockroach’

- (30) a. Input [C4]



¹³Note that the derivation is represented as if V ‘picks up’ T on its way to C. The derivation might in fact be represented with V moving directly to C, or as phrasal movement, which would be in line with observations that there is no evidence in some V2 languages such as Danish that the verb moves to T at any stage of the derivation (Vikner 1995, Jonas 1996, a.o.).

b. move V to C [D1.ii]



c. Phonological Word, [F2]
(/ praatte /)_ω

Note that in this case, when the verb moves to C, the verb complex is not yet spelled out. As such, it can be expected that the presence of C can influence the phonological form of other morphemes. This is different, as discussed in Sec. 3.1.2.1 (and see also the next section) when a phonological unit moves to C. In this case C should not be able to trigger allomorphy. A place where allomorphy of other heads in the presence of C can be found in the agreement paradigm in Dutch (and its varieties), where there is an alternation between the verb in embedded clauses and main clauses (Zwart 1993, Ackema and Neeleman 2003, Bennis and Maclean 2006, Fenger 2012, Don et al. 2013). A different place could where the effects of C might be visible is in the difference between the verbal complexes in the conjunct/independent order in Algonquian languages (Brittain 1999, 2001, Richards 2004, Bogomolets et al. 2017, 2019, a.o.).

To summarize, in this section the focus was on an output of the first cycle with multiple units in the second cycle, where each of the units was of the same type—a syntactic (complex) head. I discussed two different choice points in the derivation which lead to various outcomes. First of all, the choice in the syntax is if there is movement to C or not. Since there are two similar syntactic units, movement to C can include various options that have been discussed in the literature under for example T-C inversion or V2. Second, as was the case in the first cycle, I assumed that morphemes

can either be free or bound. When they are bound, they need to have a host of the appropriate type, a root. On the first cycle this could be achieved through head movement in the syntax. Since this operation is not available, there are two other options: movement in the morphology, or the insertion of a dummy root, an auxiliary. Even though there are only two choice points, which each have different options, I have discussed all the different outcomes and provided empirical evidence for each of these surface forms. Data points for each of the surface forms are summarized in the table below.

Surface form	Data point
G1	English T-C inversion
G2	Germanic V2; Algonquian independent order
G3	English/Japanese/Turkish simple Tense, Perfect
G4	Particle morphology (Mandarin Chinese, Kwa languages), English modals Japanese Speech Act

Table 3.7: Data points for surface forms for derivations with multiple syntactic complex heads

Even though there are only a limited amount of operations available, there are various outcomes, because the input to the second cycle consists of two units. This now leaves the last output from the second cycle: two units that are of a different type.

3.1.2.4 Input: Phonological and Syntactic Words

Finally, there is one last derivation left. This derivation is discussed last, since it actually leads to the most options. This is because there are two different types of units available: a phonological word, and syntactic material in the second cycle. This means that, with the same options discussed before (moving to C, moving or auxiliaries in the morphology) there will be more options than before. Moreover, since now there are phonological words present as an output of the first cycle, this is the only place where movement after VI is going to be visible. This section, as the subsection before with the two complex heads, is split up into two parts: the first half discusses the options without movement to C, and the second half with movement to C.

The first part of the derivations is represented in Table 3.8 for the operations that do not involve

movement to C. As before, there is no movement in the syntax, but in the morphology multiple options are available, which are discussed below the table. Moreover, note also that in the phonology there is now an additional step of movement visible, as there is already a phonological word present. This means that there are in total four different possibilities on the surface (given in G8-G11).

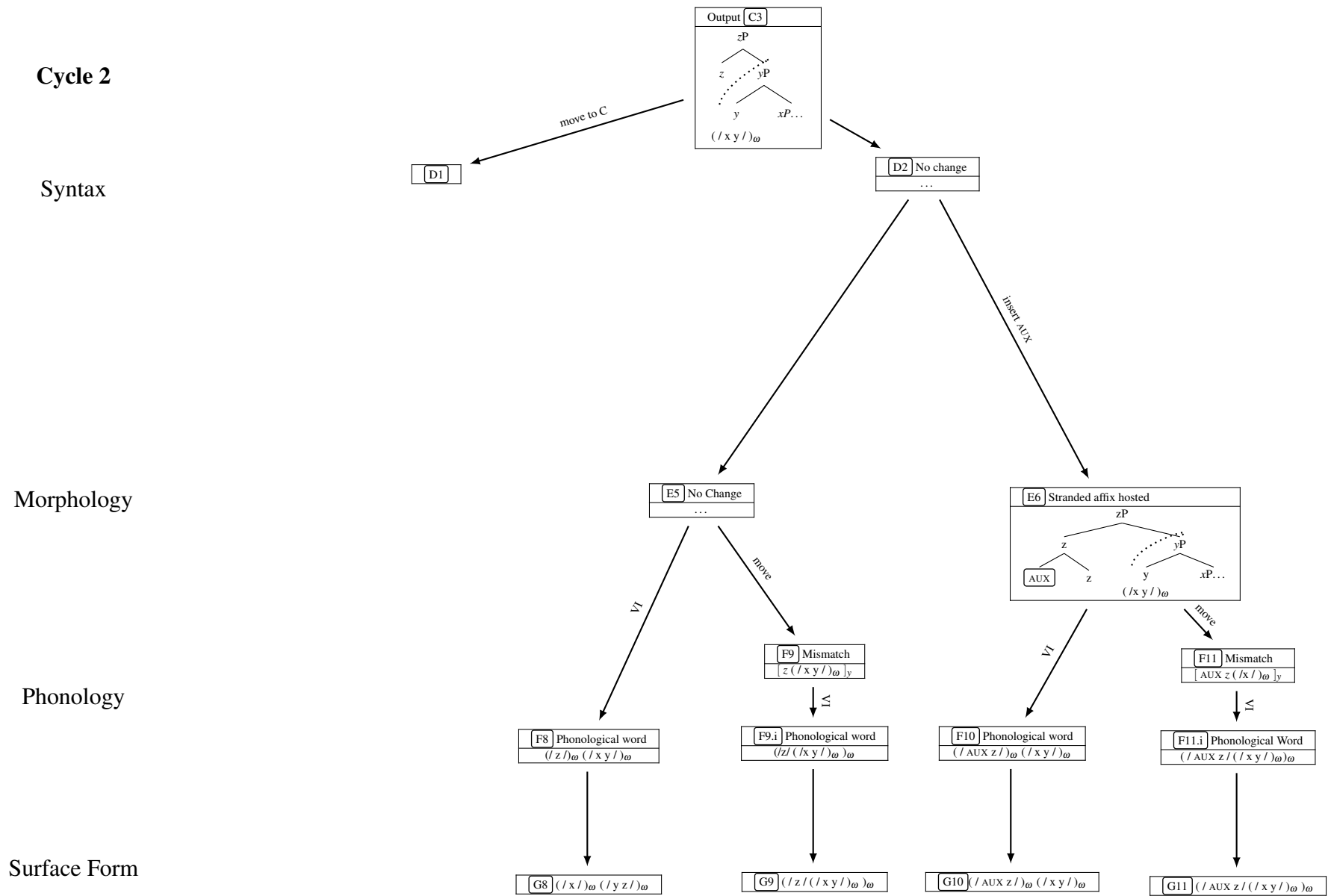


Table 3.8: Second Phase operations for phonological word with remaining heads

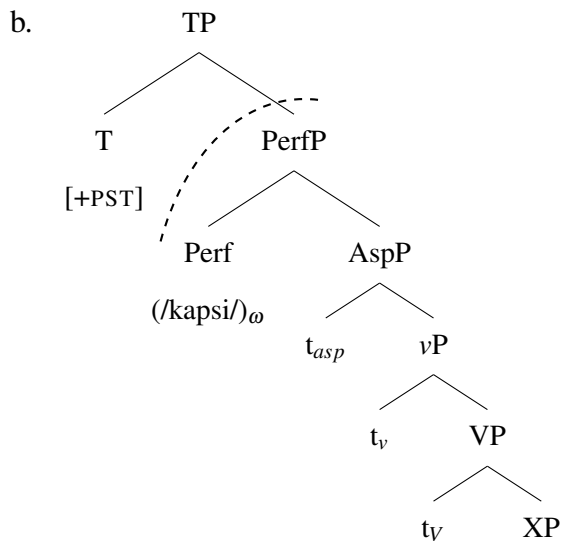
Each of the derivations will be discussed in detail and various examples with sample derivations will be presented. As before, I assume that head movement is not available. However, it is impossible on the assumption that only elements with roots can move (Cinque 2005), and since there are no roots available (only functional heads and a phonological word), movement in the syntax is ruled out independently. In the morphology there are several options. First of all, the morpheme z is of the type that does not need to be bound and therefore nothing happens; it remains separate, [E4]. When z does need to be bound by a morphological host, i.e. a root, I presented several options in the previous section: moving to find a host or auxiliary insertion. The first option, move, is not possible, since there is no root available anymore. The only material that is available is a phonological word. Thus, the only option that is possible in the morphology to have z be hosted by a root-element is the insertion of an auxiliary, [E6]. At this point for both derivations ([E5-E6]) there is still a single phonological word and a morphological word, or complex head. This means that for these two options there are two choices: either the morphological complex gets spelled out immediately, leading to [F8>G8] and [F10>G10]. The only difference is that with [F10] there is a dummy element, or an auxiliary, to host z . The other choice is to move the morphological complex and the phonological complex, [F9] or [F11]. The reasons for this might differ: in both cases the morphological requirements of z are met, since it has the host of an appropriate type. This might mean that this movement operation is optional. Another option might be that z also requires an additional phonological host, as in the case of [F9], which would make it a type of clitic. In both of these cases where movement takes place before phonologically interpreting the not-spelled out material, which can create a mismatch between syntax and phonology. That is, the surface result in [G9] and [G11] is one where there is a recursive phonological word.

With this in mind I now turn to a couple of examples. First of all, I discuss the cases that were left open at the end of the first cycle, the Perfect in Greek, and the progressive and the perfect progressive in English. All these cases, even though they were the result of a different operation in the first cycle (head movement before or after spell-out), led to a result where there is a phonological word and remaining heads in the syntax. Even though these cases vary slightly (because of a

different phase head), they are all instantiations of the surface form in [G10]. Their inputs for the second cycle are repeated from (12-32) in (31-32b).

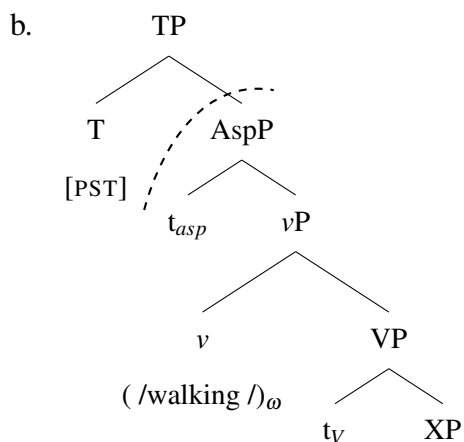
(31) [C1] with multiple heads: Greek Perfect

- a. Itan safes oti to pedhi **ixe** idhi **kapsi** epitidhes ti supa
 it.was clear that the child had.3SG already burned.PART intentionally the soup.ACC
 ‘It was clear that the child had already intentionally burned the soup’



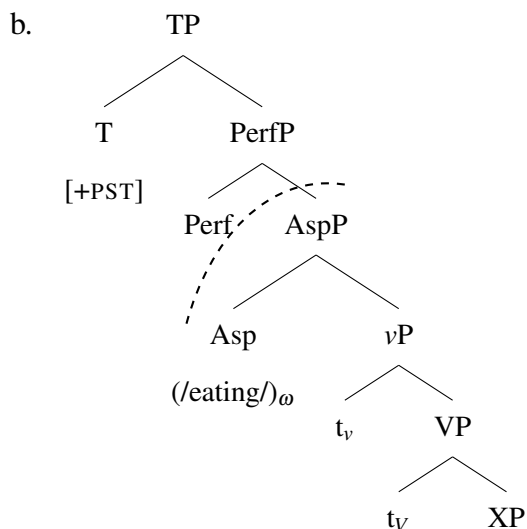
(32) [C3]: English Progressive

- a. was walking



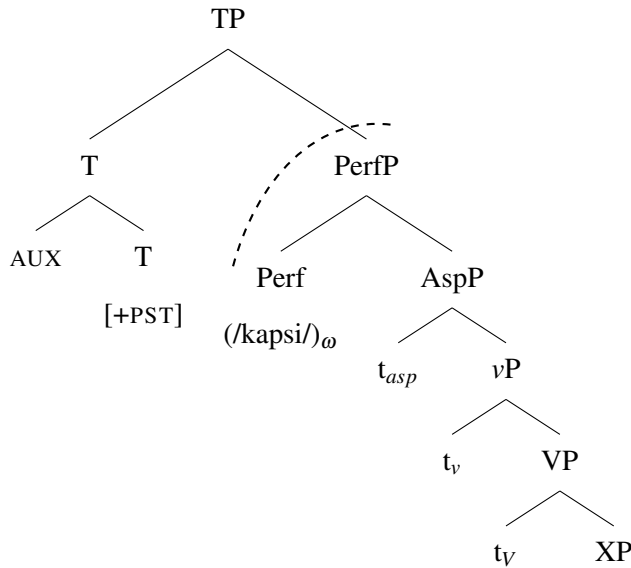
(33) C3 with multiple heads: English Perfect Progressive

- a. Baby Spice [**has**] [be **-en**] [eat **-ing**] a Chupa Chup
 B. S. AUX.PRS AUX -PRF eat -PROG a lollipop
 ‘Baby Spice has been eating a lollipop’



In all three of these cases there is a phonological word that is the spell-out of the verb. For none of these cases movement is available anymore, and as such the only solution is to insert an auxiliary; in case of the perfect there are two heads stranded and thus two auxiliaries inserted. I have only shown this for the Greek example, but the same result holds for the other derivations in English. After this phonological operations happen and the auxiliary gets spelled out as well. This is also shown for the greek example in (34b)

(34) a. Insert Auxiliary [E6]

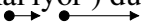


b. Phonological word [F10]
 (/ixe/) _ω (/kapsi/) _ω

Thus, at this point I have shown examples of [G10]: two phonological words, in which the auxiliary is formed on the second cycle, and the verb is formed on the first cycle. The other case where there remain two phonological words is [E5>F8>G8]. Instantiations of this derivation would be cases where a light verb remains separate from the verb stem in all cases, such as modal verbs in English and the speech act markers in Japanese.

Now I turn to the cases where mismatches arise, [F9] and [F11]. [F11] was discussed in detail in the last chapter for Turkish and Japanese mismatches. An example from Turkish is repeated below, where there is a verb form with the progressive, and tense. As can be seen, the stress falls on the aspect marker, whereas tense is included in the vowel harmony domain. In the previous chapter I have shown that syntactically the verb and the aspect are separate from the tense; and that the presence or absence of the auxiliary is phonological: it is absent in the example since it occurs between two consonants.

(35) $\boxed{C3>D2>E6>F11>F11.i>G11}$: Turkish Asp-T

- a. ((kal'iyor) du)

- b. [kal -Iyor] [i -DI]
 stay -PROG AUX -PST
 'was staying'

The derivational steps are as follows. In the morphology an auxiliary is inserted to host T: this is done for the same reason as discussed above for the progressive tense in English and the Tense head in Perfect constructions in Greek. T cannot be hosted by a phonological word, and as such it needs to be hosted by an auxiliary, (36a: $\boxed{E6}$). After this, this complex head can move onto the phonological word, (36b: $\boxed{F11}$). This means that inside the complex head there is now phonological and morphological material present. Once phonology applies to the leftover heads, (36c) stress cannot apply anymore and remains on the progressive; vowel harmony spreads through the auxiliary, and the dummy element is not inserted because it occurs between two vowels.

- (36) a. Output of $\boxed{E6}$
 [(/ kal'iyor /)_ω] [AUX T]
- b. $\boxed{F11}$: Move
 [(/ kal'iyor /)_ω AUX T]
- c. $\boxed{F11.i}$: VI & Vowel Harmony
 ((/ kal'iyor /)_ω / du /)_ω
- d. $\boxed{G11}$: Surface form
 ((/ kal'iyor /)_ω / du /)_ω

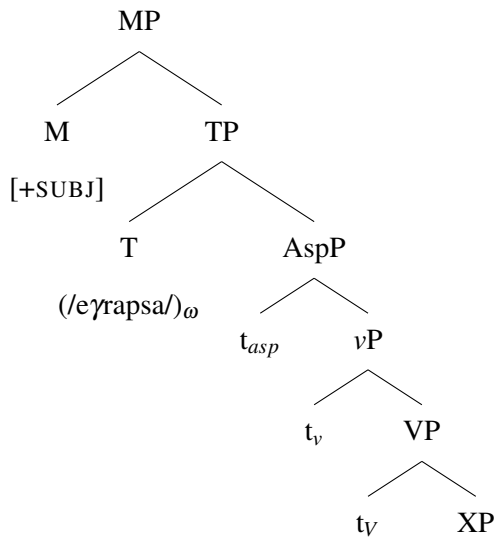
The same type of derivation accounts for the data in Japanese where the pitch contour does not spread throughout all the morphemes in certain feature combinations (PROG in combination with T), but the auxiliary still takes over the last pitch of the verb.

An instantiation of $\boxed{G9}$ would be mood and future in Greek. These data are repeated from the section discussing the first cycle in (11) for the subjunctive. The example and the output of the first cycle is given in (37). The difference with the case discussed in Turkish is that in this case in the

morphology nothing happens, [E5]. Then, after this there is the same movement operation as in Turkish, (37c: [F9]), vocabulary insertion, (37d: [F9.i]) and the output is given in (37e:[G9])

(37) [C1>D2>E5>F9>F9.1>G9] with multiple heads: Greek Mood

- a. [na= [e- γrapsa]
 SUBJ PST write.PFV
 ‘I should write it’ (Roussou and Tsangalidis 2010, p.48)
- b. [C1>D2>E5]: no change from the input



- c. [F9]: Move
 [M[+SUBJ] (/ eγrapsa /)_ω]
- d. [F9.i]: VI
 (na (/ eγrapsa /)_ω)_ω
- e. [G9]: Surface form
 (na (/ eγrapsa /)_ω)_ω

At this point all options have been discussed. Other cases that could fit in the mismatch box could be synthetic tense forms in Bantu (Barret-Keach 1986, Meyers 1990) or vowel harmony patterns in Telugu (Thornton 2020), and prefix-suffix mismatches for lexical stress in Sahaptian languages (Bogomolets 2020). See also the discussion in Sec. 3.4 in relation to mismatches and the predictions for phonology and morphology.

The derivations with a marked C are given in the following table. The only difference with the derivations discussed above is the fact that there is a step in the syntax. There are two options for

movement to C, D1, since there is phonological and syntactic content that could be moved. After this all the options are the same as for the derivations without C. They are discussed in detail below.

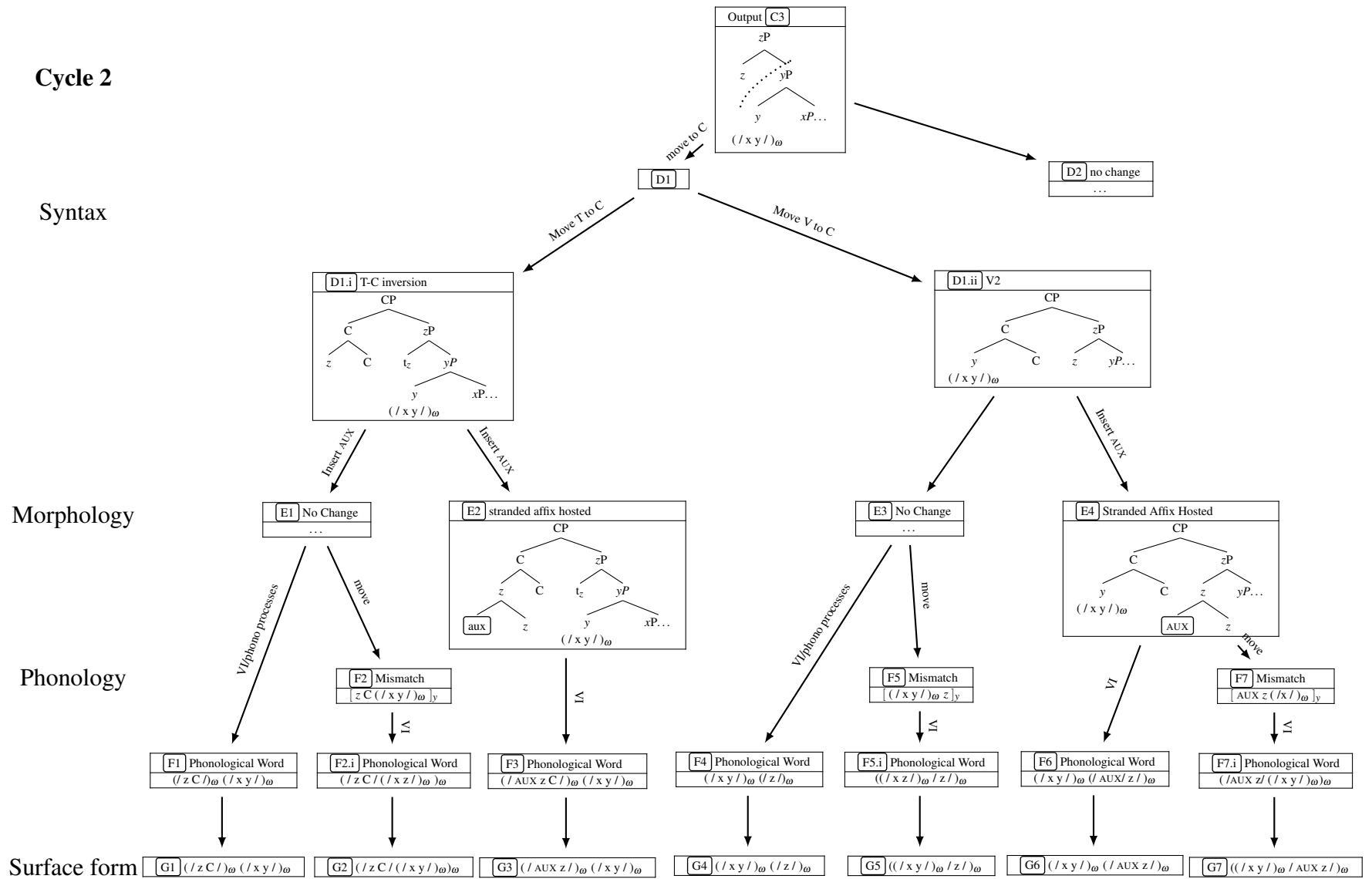


Table 3.9: Second Phase operations with C

Let us discuss how it is possible to get 7 surface forms. As mentioned above, there are no different operations than what has been discussed before. The fact that there are 7 different surface forms comes from the fact that in each step of the derivation there is a syntactic and a phonological word present. Thus, because there are two options when moving to C [D1], there are then for each of those options two choices in the morphology (move or not move); which is the same in the phonology where it is possible to move or not move. The first choice, moving the verb or highest head results in a different order of the two units: In case z moves, the linear order remains the same, but when the verb moves, z follows the main verb. This leads to the difference in order between [G1-3] versus [G4-7]. Second, because there are two choices in the morphology, it means that the output from [E1] and [E3] (nothing happens in the morphology because z is independent) has the same choices, as well as the outputs from [E2] and [E4], in which case an auxiliary is inserted. For each of these options there is the option of no movement in the phonology, or moving. Thus, for the outputs in [F1, F3, F4, F6] there are always two phonological words, because there is no movement. However, in case of [F2, F5, F7] there is an additional step of moving the morphological word into the phonological unit, which creates a syntax-phonology mismatch.

The choices in the morphology and phonology are exactly the same as discussed for the cases where there was no movement to C, but the fact that there is an additional step present in the syntax, means that there are more derivational possibilities available. Since the focus of the dissertation is not on the possibilities of movement to C, I do not present data and derivation for each of outputs in detail. . As before, I present a table with data points for the surface forms. I leave all the possibilities open for future research. Below I discuss a couple of these data points data points. In the table [G8-G11] refer to the outputs discussed earlier in this section.

Surface Form	Data point
$\boxed{\text{G1}}$ $(/zC/)_\omega (/xy/)_\omega$	Movement of Modals in Germanic languages
$\boxed{\text{G2}}$ $(/zC/(/xy/)_\omega)_\omega$	Algonquian independent order clitic; Greek M particles
$\boxed{\text{G3}}$ $(/AUXzC/)_\omega (/xy/)_\omega)_\omega$	English T-C inversion with progressive
$\boxed{\text{G4}}$ $(/xy/)_\omega (/z/)_\omega$	Wolof Tense & C
$\boxed{\text{G5}}$ $((/xy/)_\omega /z/)_\omega$	Friulian Subject/Object Clitics
$\boxed{\text{G6}}$ $(/xy/)_\omega (/AUXz/)_\omega$	VP fronting in Germanic(?)
$\boxed{\text{G7}}$ $((/xy/)_\omega /AUXz/)_\omega$	
$\boxed{\text{G8}}$ $(/z/)_\omega (/yx/)_\omega$	Japanese Speech Act
$\boxed{\text{G9}}$ $(/z/(/yz/)_\omega)_\omega$	Greek Fut particles; Bantu simple tenses
$\boxed{\text{G10}}$ $(/AUXz/)_\omega (/xy/)_\omega$	English/Turkish/Japanese Prog
$\boxed{\text{G11}}$ $(/AUXz/(/xy/)_\omega)_\omega$	Japanese/Turkish Asp-T; Telugu Vowel Harmony; Sahaptian prefixes

Table 3.10: Empirical data points for surface forms

I have discussed cases for $\boxed{\text{G8-11}}$ above. $\boxed{\text{G1}}$ and $\boxed{\text{G3}}$ are extensions of what was discussed in relation to the V-C and V-T literature above: the difference is that in this case there is already a phonological word spelled out, and as such these are instances of periphrastic forms. The cases where there are patterns of a spelled out element in C, and a stranded head could be indicative of the data discussed for Wolof in (Martinović 2019), and Friulian subject and object clitics (Calabrese and Pescarini 2014). In these languages there is evidence that an already phonologically interpreted verb moves to C, which interacts with the spell-out of other heads. Option $\boxed{\text{G2}}$ could be an instantiation of the independent order, mentioned already in the previous section. However, in this case there is evidence that there is a marker that patterns phonologically different from other verbal material and has been situated high in the clause (Newell and Piggott 2014). Finally, a couple of options remain open. Either the system overgenerates for these patterns, or there are instances of these cases. In any case, discussing surface form in this way leads to interesting predictions that will be tested in the following sections.

3.1.3 Summary and predictions

This section focused on all possible derivations in the system proposed here. Crucially, I used the various movement operations that have been proposed that lead to word-building, and showed how

this can all be a single operation that applies at different stages of the derivation. The types of movement are summarized in Table 3.11 below.

	Syntax	Morphology	Phonology
Combines	X^0	X^0	X^0 and ω
Locality	HMC	(structural) adjacency	(linear) adjacency
Effect:	<SO: phase extension >SO: phases block	S-M mismatch	S-P mismatch

Table 3.11: Timing of movement

There are two other assumptions that I used. The first is the assumption that there are two types of morphemes: those that are bound and those that are free.¹⁴ Crucially, when morphemes are bound, they need to be hosted by a root-like element in the morphology. This can be achieved in various ways, and at various steps in the derivation, (38). On the first cycle this can be done already in the syntax, through head movement. I assumed that head movement is not available in the second cycle, which means that those heads that are not combined through head movement but still need to be hosted can be ‘rescued’ in the morphology. This can be done by movement, or when this is not available, through auxiliary insertion.

- (38) Host bound morphemes
- a. Syntax: Head Movement
 - b. Morphology:
 - i. Move
 - ii. Auxiliary insertion

Finally, I proposed that, as an analogy to the syntactic spell-out domain, I proposed that when the complex head includes the phase head it can be interpreted in the phonology, (39).

- (39) X^0 with a phase head can be interpreted in the phonology

I argued that there is one operation that can influence this, namely the removal of unmarked heads. Crucially, when a phase head is unmarked for a feature value, it will be removed and as such

¹⁴See also Chapter 5 for how this distinction plays a role in auxiliary patterns cross-linguistically.

the complex head cannot be interpreted in the phonology. The complex head will then remain in the syntax for the second cycle. I have shown derivations for each of the possible combinations, and presented various data points that could be accounted for this way.

Crucially, it might look like the system overgenerates, since different derivations can lead to the same surface form. There are two types of examples. First, I have discussed that a synthetic tense in Greek has a different derivational history than a synthetic tense in English, Turkish or Japanese: In Greek, because there is a step of movement before spell-out, there is phase extension, which means that on the first cycle V+T gets spelled out together. In English, however, I argued that the derivation consists of two steps, where T remains outside of the morphological and syntactic word until the end of the second cycle. The second type of example consist of the same surface form for a derivation with C and one without.

This might be an unwelcome result, but the fact that the system generates the same surface form via different derivations makes predictions and this will be the focus of the remainder of the chapter. Thus, for example, the one that will not be discussed in detail are the derivations with and without movement to C. However, in this case, even though the outputs might be very similar, the derivation looks at a different domain (i.e., the C domain or not), and therefore should have different effects.

The second type of prediction will be discussed in more detail. Specifically, I focus on three different types of predictions. The first prediction that will be tested, in Sec. 3.2, is in fact the first step of the derivation on the first cycle, namely A: Head movement and Spell-Out are ordered. The two different options are repeated in the figure below.

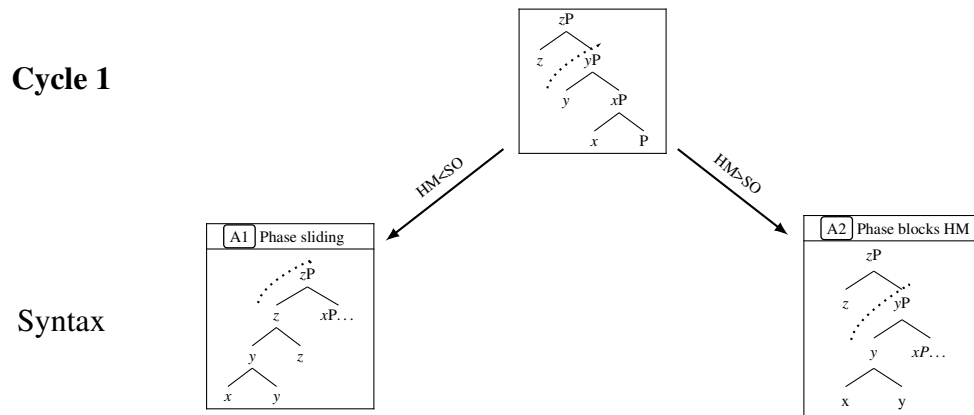


Table 3.12: First Phase operations: Syntax

The assumptions I used were as follows. Either head movement happens before spell-out, in which case it can lead to phase extension; or it can happen after spell-out in which case head movement is blocked by phases. This is summarized in the assumptions in (40).

(40) A. Syntax: Order of Head Movement (HM) and Spell-Out (SO)

A1. HM<SO (Koopman 1984, Travis 1984, Baker 1985, 1988, Roberts 2010a)

- * Can pass phases (phase extension) (Bobaljik and Wurmbrand 2005, den Dikken 2007, Gallego and Uriagereka 2007c,a)
- * Direction is upwards (Koopman 1984, Travis 1984, Baker 1985, 1988, Roberts 2010a)
- * Locality: Head Movement Constraint (Koopman 1984, Travis 1984, Baker 1985, 1988)

A2. HM>SO (Chomsky 2001, Schoorlemmer and Temmerman 2012, Platzack 2013)

- * Blocked by phases (= the spell-out domain)
- * Direction can be up or down (Harizanov and Gribanova 2019, Arregi and Pietraszko 2019a)
- * Locality: Head Movement Constraint (Koopman 1984, Travis 1984, Baker 1985, 1988)

If this is the case, there should be evidence for this split in different languages other than synthetic and periphrastic verb forms. I do this first of all by looking at a domain where this has been tested before, namely verb stranding ellipsis. I show in Sec. 3.2.1 that the patterns that have been discussed in the literature are also found for the languages that I argue to have movement before and movement after spell-out. Second, I briefly discuss in Sec. 3.2.2 what predictions this

makes for other domains where there can be a difference in domain size through phase extension by looking at extraction asymmetries. Finally, in Sec. 3.2.3 the focus is on one of the languages discussed in detail in the previous chapter, Japanese. This language has been discussed extensively in the literature in regard to the status of head movement taking place in the syntax or not. I look at two arguments that have been put forward for movement before spell-out and show how there is no conclusive evidence for this view. In fact, I show that the analysis put forward here can fit the data as well.

Second, I look in Sec. 3.3 at the prediction that some synthetic forms are derived via two cycles, whereas others are derived via a single cycle (i.e. the synthetic forms in English versus Greek). This makes the prediction that for those languages that have synthetic forms via a single cycle, there should be evidence that the heads that are only combined on the second cycle remain separate in the syntax. That is, there is a mismatch in that in some languages the morphological word is of a different size than a syntactic word. The domain where I will test this is VP ellipsis and mismatches between inflection, this will be done in Sec. 3.3.1. Moreover, this also relates to the discussion in the literature on verb-height and I discuss how the system proposed here can deal with this in Sec. 3.3.2.

Finally, I discuss predictions in relation to the interfaces in Sec. 3.4 and the fact that sometimes a phonological word does not align with a syntactic or morphological word (I discuss cases of morphological and syntactic mismatches in Sec. 3.3). I discuss what the predictions are for morphological (Sec. 3.4.1) and phonological (Sec. 3.4.2) processes.

3.2 Testing Predictions I: Movement before/after Spell-Out

This section focuses on the first step in the first cycle: the choice between the ordering of head movement and Spell-Out. Recall that there are two different options. I have repeated the assumptions and the derivational steps below. Either Head movement extends the phase, in which case I propose it happens before Spell-Out; or head movement is blocked by the phase, in which case I propose it

happens after Spell-Out.

(41) A. Syntax: Order of Head Movement (HM) and Spell-Out (SO)

A1. HM<SO (Koopman 1984, Travis 1984, Baker 1985, 1988, Roberts 2010a)

- * Can pass phases (phase extension) (Bobaljik and Wurmbrand 2005, den Dikken 2007, Gallego and Uriagereka 2007c,a)
- * Direction is upwards (Koopman 1984, Travis 1984, Baker 1985, 1988, Roberts 2010a)
- * Locality: Head Movement Constraint (Koopman 1984, Travis 1984, Baker 1985, 1988)

A2. HM>SO (Chomsky 2001, Schoorlemmer and Temmerman 2012, Platzack 2013)

- * Blocked by phases (= the spell-out domain)
- * Direction can be up or down (Harizanov and Gribanova 2019, Arregi and Pietraszko 2019a)
- * Locality: Head Movement Constraint (Koopman 1984, Travis 1984, Baker 1985, 1988)

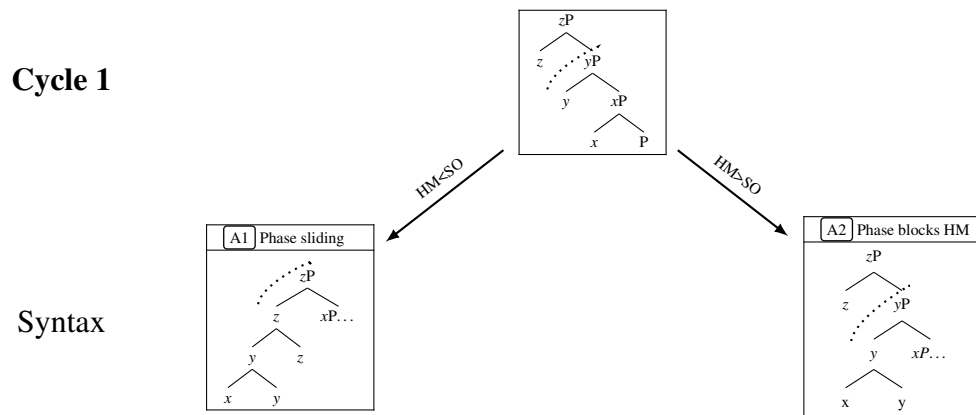


Table 3.13: First cycle operations: Syntax

If it is the case that there are two different times in the syntax that movement can take place, this should be visible in other parts than the verb forms. The verb forms themselves are also predicted to be different: when head movement takes place before Spell-Out, phase extension is possible, which means that the prediction is that the verb can have more morphemes agglutinated on the stem, which form a single syntactic, morphological, and phonological unit. This is different from a language where head movement takes place after spell-out. In this case, specifically when there is a marked phase head, the phase head and any heads outside of the first cycle can never end up in the

syntax or morphology in the same word-unit (see Sec. 3.4.2 for how these heads can combine in the phonology). This is what was shown for English and Greek. In the former language (as was also the case in Turkish and Japanese in the previous chapter), tense, a head from the second cycle, and aspect can never combine in the same verb form, forming a single syntactic, morphological, and phonological unit, (42a). This is different in Greek, where tense and aspect can combine inside a single synthetic verb form, (42b).¹⁵

- (42) a. * [eat -ing -ed] [English]
- b. [é -tro -a] [Greek]
 PST -eat.IPFV -1.SG.PST
 ‘I was eating / I used to eat’

I have argued that this difference can be explained by assuming different timing of head movement. The remainder of this section focuses on other pieces of evidence in other parts of the grammar where this distinction can have an effect. I discuss three cases.

The first part, Sec. 3.2.1 focuses on the literature that deals with matching of verbs in particular ellipsis contexts, namely verb-stranding verb phrase ellipsis. The literature on this subject shows there are different identity requirements on verbs in different languages, which can be accounted for by assuming a different type of movement, which in my theory means a different timing of movement. Crucially, the languages discussed in this and the previous chapter as having a particular type of derivation pattern with those languages that have been said to have movement before or after spell-out. Moreover, I show that this can be tested in Turkish and Japanese, two head final languages. In these languages it is difficult to determine head movement, since the surface form would yield the same result, whether the verb has moved or not.

Second, I briefly talk about other literature on phase extension in Sec. 3.2.2 and how the extension of the phasal domain can be tested in other domains than verbs. I look at two arguments

¹⁵The prediction for languages with head movement before spell-out is that it *can* lead to phase extension, but it does not need to. Thus, it could be the case that there are languages that have movement before spell-out, but only have movement to a head below the first phase. However, when a language has movement after spell-out, it can never combine heads from higher phases in the same syntactic or morphological verb form when there is a marked phase head.

from the literature in relation to word-order differences that relate to verb movement, and one from the NP domain. Specifically, I discuss an extraction asymmetry between two languages with affixal-determiners and discuss how this potentially can be analyzed as a timing difference for movement.

Finally, in Sec. 3.2.3 I focus in more detail on Japanese. This language has been discussed in great detail with regard to where head movement takes place. Specifically, I look at two arguments that have been put forward in favor of a ‘syntactic’ type of movement (i.e., movement before spell-out), and I show how these data do not necessarily fit with this line of reasoning but can also be explained in the theory put forward here.

3.2.1 Verb-stranding Verb Phrase ellipsis and verb matching

This section provides evidence for the ordering of head movement and spell-out in the syntax by looking at variation in verb stranding verb phrase ellipsis, or verb stranding ellipsis (VSE). A language like English can have a type of VP-ellipsis, but a *do* verb is still pronounced. There are languages which seem to have VP ellipsis as well, but the difference with English is that in this case the verb is still pronounced. This is shown for Greek and Japanese, (44,45).¹⁶

(43) Posh spice wanted to **buy** a black Gucci dress, and she **did** ~~buy a black Gucci dress~~

(44) epidhi i anna ithele na **agorasi** psomi, **agorase** psomi
 because the anna wanted SUBJ buy.3SG bread bought.3.SG bread
 ‘Because Anna wanted to buy bread, she did’ Adapted from (Merchant 2018, 233)

(45) a. Pikachu-wa kuruma-o teineini **arat-ta**
 Pikachu-TOP car-ACC carefully wash-PST
 ‘Pikachu washed the car carefully’

b. togepi-wa kuruma-o teineini **arat-anak-atta**.
 Togepe-TOP car-ACC carefully was-NEG-PST.
 ‘Togepe did not (wash the car carefully).

¹⁶Japanese does also have do support (see also Sec. 3.2.3.1), and in fact has a construction that looks similar to English VP ellipsis with do as in (43). What I have not included at all in the discussion here is what the exact size of the ellipsis site is in English nor Japanese, and it might be that this can explain when VSE and when ellipsis with do-support appears in Japanese. I leave this for future research.

This type of pattern can at first sight be accounted for by assuming that in English the tense marker cannot lower onto the verb, since it is elided, and thus ‘do’ is used, whereas in the other languages the verb can move outside of the ellipsis site (a proposal has been made along these lines by McCloskey 1991, Bobaljik 1995, Arregi and Pietraszko 2019b). The English type of movement has been taken as a type of movement that takes place during spell-out, whereas raising is not necessarily so. That is, the evidence for movement after spell-out in English is that T cannot combine with V and *do* is inserted. As discussed in the previous section, Greek has been used as an example of movement before spell-out: the verb moves to a higher position than the ellipsis site and remains pronounced. The fact that Japanese has similar verb-stranding patterns to Greek could then be taken as evidence that Japanese also has movement to T, which then would be a problem for the argument made here that Japanese has movement after spell-out.

However, it has been noted in the literature, there are two types of VSE languages (Gribanova 2018, 2020) which can be teased apart by looking at identity requirements on the verbs. That is, there are languages that require both their verbs to be identical, and those that do not. Interestingly, it has been argued that these differing requirements can follow from movement before or after Spell-Out (Gribanova 2018, 2020). This part of verb stranding is what is crucial here, and will be investigated here, specifically with regard to Japanese and Turkish. I show that the pattern that has been argued in the literature to be analyzed best as movement after spell-out is exactly the pattern that is found in Japanese and Turkish. This means that there is a way to tease apart verb movement that occurs before and after spell-out, even in languages that are head final, like Japanese and Turkish.

First, the distinction for the identity requirement is discussed for languages described in the literature. From this, predictions can be formulated about what to expect for Japanese, Turkish and Greek (English does not have this type of ellipsis). This requires some explanation regarding the status of VSE in Japanese and Turkish, since there is a discussion in the literature how the absence of material is best analyzed. However, once it is shown that VSE does exist in both languages, I show that the verb requirement patterns along the lines of the languages argued to have movement

after spell-out, rather than before. I contrast various languages in this section, namely languages that have been used to argue for movement before spell-out such as Russian, and languages that have been used to argue for movement after spell-out, such as Irish and English. Crucially, I show that Japanese and Turkish pattern with Irish, and Greek patterns with Russian.¹⁷ The result will be a three-way distinction: Even though Japanese, Turkish, Irish and English are all the result of movement after spell-out, they differ in whether and where the verb is pronounced; Second, Greek, Russian, Irish, Japanese, and Turkish all have a full verb stranded, English does not. Finally, the languages with a full stranded verb differ with respect to verb-identity. I argue that this indicates differences in timing of movement. The different properties are discussed in the table below 3.14.

	Greek/Russian	Japanese/Turkish/Irish	English
HM<SO	✓	✗	✗
V in VSE	✓	✓	✗
Identity in VSE	✗	✓	✓

Table 3.14: Overview movement, vse, and identity

One of the defining factors of VSE, people have argued, is the fact that the verbs need to match in their identity (Stjepanovic 1997, 1999, Schoorlemmer and Temmerman 2012, Van Craenenbroeck and Merchant 2013, Lipták 2015). This has been dubbed the Verbal Identity requirement by (Goldberg 2005), (46).

(46) *The Verbal Identity Requirement (VIR)*

The antecedent- and target-clause main Vs of VP ellipsis must be identical, minimally, in their root and derivational morphology.

A clear case of this can be seen in Irish, where the verbs must be identical: (47) is grammatical, but when the verbs are mismatch, the result is ungrammatical, (48).

- (47) a. Ar **chuir** tú isteach ar an phost? [Irish]
 INTERR-PST put-PST you in on the job?
 ‘Did you apply for the job?’

¹⁷There seems to be variation with regard to Greek speakers whether they allow VSE-type constructions (pc. Christos Christopoulos), but what needs to be determined is the languages that do not have the identity requirement in fact have VSE-type ellipsis, or ellipsis of a smaller constituent, like an argument.

- b. **Chuir** / Níor **chuir**
 put-PST NEG-PST put-PST
 ‘I did / I didn’t’ (McCloskey 2011)

- (48) *Níor **cheannaigh** mé teach ariamh, ach **dhíol**.
 NEG.PST buy I house ever but sold
 ‘I never bought a house, but I sold one’ (McCloskey 2017, 128)

It has been proposed in these cases that movement takes place only after the ellipsis matching has been computed to account for the data. That is: at the point where the matching requirement needs to be satisfied the verb remains inside the ellipsis site and this means that the two VP’s do not match in the case of (48): one VP contains the verb *buy*, whereas the other contains *sell*. To account for the fact that the second verb is still pronounced, it is assumed that the verb only moves after this matching between the antecedent and the ellipsis site has taken place. In other words, this data has been taken to mean that the verbs move after spell-out, rather than before. However, this requirement has been challenged in the literature, since it does not seem to hold in all languages that have VSE. For example, in Russian mismatches are allowed, (49).

- (49) a. Našěl li Paša knigu v biblioteke, i žurnal v stolovoj?
 find.PST.SG.M Q Paša book.ACC in library.PREP and magazine.ACC in cafeteria.PREP
 ‘Did Pasha find a book in the library, and a magazine in the cafeteria?’
- b. Net, ne **Našěl**, a **poterjal** [Russian]
 No, NEG find.PST.SG.M but lose.PST.SG.M
 ‘No, he didn’t find (...), he lost (...)
- (Gribanova 2017)

As Gribanova (2018, 2020) points out, this could mean two things. One would be that either Russian or Irish does not involve VSE and the variation comes from different constructions (i.e., only language can be derived via argument ellipsis for example). The other option would mean that both languages have true VSE, but that the difference with regard to the VIR comes from the way head movement interacts with ellipsis. (Gribanova 2020) shows that there must be true VIR in some languages with VSE, namely Irish, Scottish Gaelic and Uzbek, and that this cannot be attributed to other mechanisms. She argues that this difference follows from two types of head movement: in languages where mismatches are allowed, the verb syntactically moves before the ellipsis site

is calculated. This means that the verbs can mismatch, because the ellipsis site does not contain material that is in conflict with the antecedent, because the verb is not present anymore.¹⁸ However, in case mismatches are not allowed, movement of the verb takes place after ellipsis is calculated, and thus is a form of movement at PF. When the matching between the antecedent and ellipsis site are calculated, the verbs are still inside the VP, which means they need to be identical. In the system proposed here, it means that it is in fact the same operation, but the timing is different: either movement takes place before or after spell-out. Thus, we end up with the following summary, where Russian can be replaced with Hungarian, European Portuguese, Swahili and Greek, and Hebrew (Gribanova 2013, 2017, Lipták 2013, Santos 2009, Ngonyani 1996, Merchant 2018, Landau 2018), and Irish can be replaced with Scottish Gaelic and Uzbek, (McCloskey 2011, 2017, Thoms 2016).

	Russian	Irish
HM<SO	✓	✗
VSE	✓	✓
VIR holds	✗	✓

Table 3.15: Summary VSE and head movement

Now we can return to the languages discussed in this dissertation, specifically those that I argued to have movement after spell-out: Japanese and Turkish. English, as discussed above does not have this type of ellipsis and can thus not be tested this way. First I focus on Japanese, and provide an analysis and then I turn to Turkish. Before we can turn to the VSE data in Japanese, what needs to be shown is that Japanese does in fact have VSE. A large part of the discussion in the literature in Japanese revolves around the analysis of what the exact content is of the material that is elided in a sentence as in (50).

- (50) Totoro-wa booru-o ut-ta kedo, Mei-wa b̄œ̄ru-ø ut-anak-atta
 Totoro-TOP ball-ACC hit-PST but Mei-TOP ball-ACC hit-NEG-PST
 ‘T. hit ball, but Mei didn’t hit ball’ based on (Funakoshi 2016, 114)

There are three potential analyses that have been put forward at this point, they are schematically

¹⁸This raises questions for what it means for the verb to not be present anymore. Under the copy theory of movement there would still be a copy present in the base position. I assume (see below) that the moved verb is converted into a trace.

represented in (51). The first one assumes that the elided element is *pro*, (Kuroda 1965, Ohso 1976, Hoji 1985). The second analysis assumes that this involves argument ellipsis (Oku 1998, Goldberg 2005, Takahashi 2006, 2008, Saito 2007, Takit 2011, Sakamoto 2016). The last analysis proposes that there is in fact ellipsis of a whole phrase, such as VP, and that as a result the verb moves outside of the VP, so called verb-stranding VP ellipsis, or verb stranding ellipsis (VSE) (Otani and Whitman 1991, Koizumi 2000, Funakoshi 2014, 2016, Hayashi 2015, Hayashi and Fujii 2015, Abe 2019).

- (51) Possible analyses for (50) (from Funakoshi 2016, 114)
- | | | | | |
|----|---------|--|-------------|----------------------------|
| a. | Mei-TOP | <i>pro</i> | hit-NEG-PST | <i>pro</i> -analysis |
| b. | Mei-TOP | baru - \emptyset | hit-NEG-PST | Argument ellipsis-analysis |
| c. | Mei-TOP | $[\text{VP } \overline{\text{baru}} \text{ } \overline{\text{hit}}]$ | hit-NEG-PST | VSE-analysis |

It is well established that Japanese does have *pro*. Moreover, as Funakoshi (2014, 2016) points out, there are many constructions where argument ellipsis seems a better analysis than VSE. This has often been taken as evidence that Japanese does not allow VSE at all. However, as Funakoshi (2014, 2016) argues most of the arguments against VSE revolve around the fact that this should be the only way to derive null arguments in Japanese; the only actual argument against VSE in Japanese is concerned with null adjuncts. Adjuncts are argued to not be null in Japanese, but Funakoshi shows that they can be null when the clause-mate object or other VP internal elements are also null. The problem for VSE analyses with regard to the data in (50) has to do with the observation about (im)possible readings of the adjunct. Thus, in order to test if the object is elided, or a complete VP, a diagnostic is to see if other material gets elided as well, i.e. VP-adjuncts. The argument is based on the following type of examples based on (Oku 1998), (52)¹⁹

- (52) a. *Pikachu-wa kuruma-o teineini arat-ta*
 Pikachu-TOP car-ACC carefully wash-PST
 ‘Pikachu washed the car carefully’
- b. *togepi-wa kuruma-o teineini arat-anak-atta*
 Togepi-TOP car-ACC carefully wash-NEG-PST
 ✗ ‘Togepi didn’t wash the car carefully’
- ✓ ‘Togepi didn’t wash the car (at all)’ based on (Oku 1998, p.171)

¹⁹Washing cars is obviously very common in the Pokémon world.

According to Oku, the sentence in (52b) can mean that Togepi didn't wash the car at all, but it cannot mean that Togepi washed the car in an uncareful way. The latter reading should be allowed under a VSE analysis: it would mean that it should be possible to elide the VP adjunct, as well as the object. It thus seems that only the object is deleted. Funakoshi observes that the adjunct reading is available with the correct context.²⁰ Providing the sentences in (52) with the appropriate context, as given in (53). In this case, having sentence (52b), repeated in (53) can have the adjunct reading.

(53) Context: Pikachu and Togepi washed their owner's cars to get food. Pikachu was thorough in his work, while Togepi was not. based on (Funakoshi 2016, 119)

- a. *Pikachu-wa kuruma-o teineini arat-ta*
Pikachu-TOP car-ACC carefully wash-PST
'Pikachu washed the car carefully'
- b. *togepi-wa ~~kuruma-o teineini~~ arat-anak-atta.*
Togepi-TOP car-ACC carefully wash-NEG-PST.
Togepi-ga arat-ta atto-no kuruma-wa kitanak-atta
togepi-NOM was-PST after-GEN car-TOP dirty-PST
'Togepi did not wash the car carefully. The car that Togepi washed was dirty'

In order to make the adjunct reading more salient, not only providing enough context is showing this effect. Importantly, it helps if the second clause is negated, and uses 'but' or 'also', both Takahashi (2008) and Funakoshi (2014, 2016) observe: a contrast between the antecedent and ellipsis sentence (i.e. 'Pikachu washed the car carefully but Togepi did not') (Funakoshi 2014) is fine, or where the antecedent sentence is negated ('Pikachu didn't wash the car carefully and Togepi didn't either') is grammatical as well.²¹ I take this to mean, following Funakoshi (2014, 2016) that Japanese does have VSE at least in the contexts above. I do not claim that all instances of an elided argument indicate that there is VSE; there could be multiple processes that are picked out in different environments.

Generally, the proposals that assume that there is VSE, assume that this evidence for syntactic verb movement, in order for the verb to be pronounced (Otani and Whitman 1991, Koizumi 2000,

²⁰A similar test is developed by Landau (2018) to test if adjuncts are elided or not.

²¹Sakamoto (2017) argues that VSE data can still be accounted for with argument ellipsis. However, the data he discusses do not use the same controls as used here, involving negation, and contrasting with 'but'. Thus, it might well be that his data in fact is argument ellipsis, rather than VSE.

Funakoshi 2014, 2016, Hayashi 2015, Hayashi and Fujii 2015, Abe 2019), and seems to go against analyses that argue that there is no movement in the syntax (Sells 1995, Hoji 1998, Sakai 1998, Fukui and Takano 1998, Fukui and Sakai 2003, Koopman 2005, Aoyagi 2006, Kishimoto 2006, 2013, Shibata 2015). However, we now have a test from cross-linguistic data to distinguish what type of movement is used in Japanese. The question that remains is if the movement of the verb happens before or after ellipsis matching is calculated. Up until this point, I have argued that word formation in Japanese involves movement in PF, and not syntactic movement. If Gribanova (2018, 2020) is correct about the correlation presented in table 3.15, and I am correct in arguing that Japanese has movement at PF, this makes the prediction that the VIR should hold in Japanese. Otani and Whitman (1991) argue that the verbs can mismatch, as shown in the adapted example from their paper in (54).

- (54) Totoro-wa zibun-no baru-o **tatai**-ta kedo, Mei-wa ~~zibun-no baru-o~~ **ket**-ta
 Totoro-TOP self-GEN ball-ACC beat-PST but Mei-TOP self-GEN bal-ACC kick-PST
 (Lit.) ‘Totoro beat his ball, but Mei kicked it.’ based on (Otani and Whitman 1991, 350-51)

However, this construction does not necessarily involve VSE, but can be accounted for by assuming that what is elided is *pro* (Hoji 1998) or an argument (Oku 1998). With the discussion above in mind, including more material than an object such as an adjunct, making sure that the context is salient enough to allow for the adjunct reading, and having negation in the second sentence, Funakoshi argues that the following examples provide evidence that the verbs cannot mismatch, (55). Crucially, having the same verb in each sentence is fine, as is shown in (56). The data is based on (Funakoshi 2014, 331-2).

- (55) a. *Togepi-wa (itumo) zikandoorini **ku**-ru kedo,
 T.TOP always on.time come-PRS but
 Ookido-hakase-wa (itumo) zikandoorini **omieninar**-ana-i
 Oak.-prof.-TOP always on.time come.HON-NEG-PRS
 Intended: ‘Togepi always comes on time, but Prof. Oak always doesn’t come on time’
- b. *Ookido-hakase-wa (itumo) zikandoorini **omieninar**-u kedo,
 Oak-prof.-TOP always on.time come.HON-PRS but
 Togepi-wa (itumo) zikandoorini **ko-na**-i
 T.-TOP always on.time come-NEG-PRS

Intended: ‘Prof. Oak always comes on time, but Togepi always does not come on time’

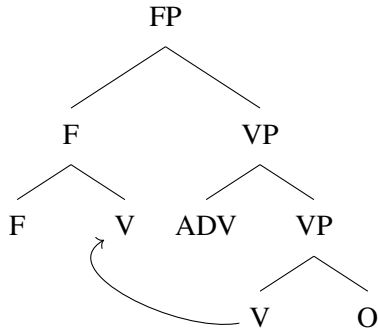
- (56) a. *Pikachu-wa (itumo) zikandoorini ku-ru kedo,*
 P.-TOP always on.time come-PRS but
Togepi-wa (itumo) zikandoorini ko-na-i
 T.-TOP always on.time come-NEG-PRS
 ‘Pikachu always comes on time, but Togepi always does not come on time’
- b. *Utugi-sensei-wa (itumo) zikandoorini omieninar-u kedo,*
 Elm-prof.-TOP always on.time come.HON-PRS but
Ookido-hakase-wa (itumo) zikandoorini omieninar-ana-i
 Oak-prof.--TOP always on.time comeHON-NEG-PRS
 ‘Prof. Elm always comes on time but Prof. Oak always doesn’t come on time’

To summarize, languages differ in the requirements they impose on the stranded verb. There are languages that require their verbs to be identical in VSE constructions, and those that do not. This has been used, independently, as an argument for a split between syntactic movement of verbs, and head movement taking place at PF. Interestingly, the languages that I argue to have movement at PF only, based on their auxiliary patterns have the VSE-verb requirement that has been associated with this type of movement as well. This is important, since it is quite tricky to find evidence for one or the other type of movement in these languages, because they are strictly head final. Before showing similar data for Turkish, I show how this can be analyzed.

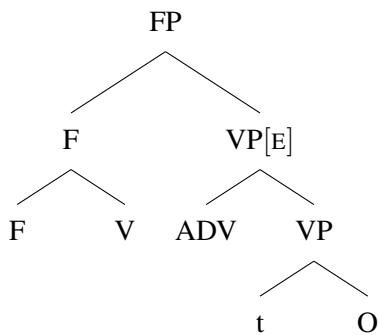
What this means in terms of an analysis is the following. I assume following Merchant (2001) that in order for ellipsis to take place, identity for the elided constituent needs to be computed, and that this is the same across languages. I assume that this identity computing takes place as soon as material gets sent to spell-out. The crucial part is that head movement can take place before the computing of the identity, or after, which yields different results for the verbal identity requirement (similar to Gribanova 2020). However, in both cases I assume that movement occurs before a constituent does not get pronounced. This means that in Greek and Russian, movement happens before both operations that are needed for ellipsis, (57). The verb has moved to a higher position than the phrase that will be identified as needing to be elided. Then, when material gets sent to spell-out, the phrase gets marked for ellipsis and thus needs to match its antecedent. In this case it means that only the object and any other material such as adjuncts need to match the antecedent,

but the verb does not have to since it is not there anymore.

(57) a. [Step #1: Movement]

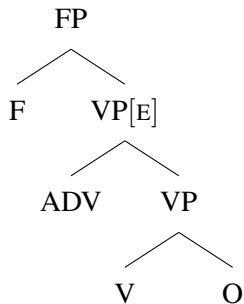


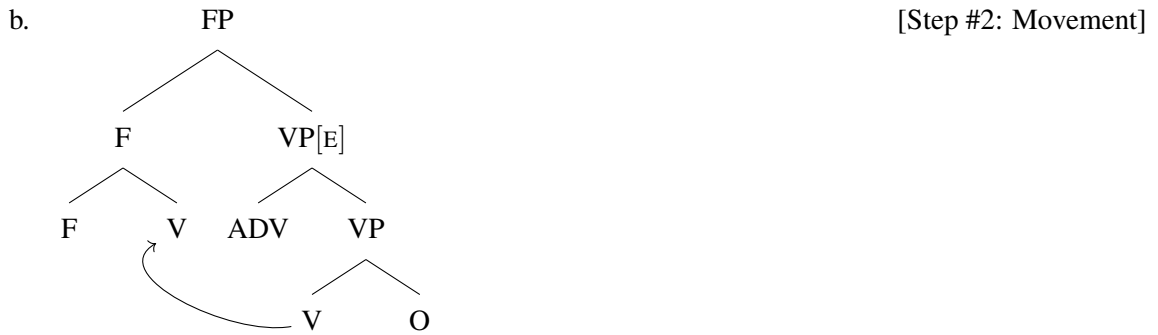
b. [Step #2: Identity]



In Japanese (or Irish) there is a different timing for when movement happens, (58). After syntax is built, the verb phrase gets marked for ellipsis. Again, this means that this constituent needs to be identical to its antecedent. Thus, at this point the verb is still in this constituent and as such needs to match the verb in its antecedent. After this, head movement takes place, and finally ellipsis. Crucially, since head movement takes place after the marking for ellipsis, the verb needs to match the verb in the antecedent.

(58) a. [Step #1: Identity]





A question that arises is where Turkish fits into this picture, if it allows for VSE. The data here are very preliminary, but based on the same tests as in Japanese the same results are obtained. That is, when properly controlled for the context, Turkish does allow VSE. Moreover, it seems that Turkish obeys the identity requirement on the verbs. As is the case for Japanese, Turkish allows for the deletion of at least an argument, as is shown in (59): As a possible answer to the question all arguments can be pronounced, (59a), or the different object only, (59b), but it is not possible to elide *girl* as well, (59c).

- (59) Oğlan-ı oğlağ-a dönüş-tür-dü mü?
 boy-ACC baby.goat-DAT turn.into-CAUS-PST Q?
 ‘Did he turn the boy into a baby goat?’
- a. Hayır, kız-ı oğlağ-a dönüş-tür-dü.
 No, girl-ACC baby.goat-DAT turn.into-CAUS-PST
 ‘No he turned the girl into a baby goat’
- b. Hayır, kız-ı oğlağ-a dönüş-tür-dü.
 No, girl-ACC baby.goat-DAT turn.into-CAUS-PST
 ‘No he turned the girl into a baby goat’
- c. *Hayır, kız-ı oğlağ-a dönüş-tür-dü.
 No, girl-ACC baby.goat-DAT turn.into-CAUS-PST
 ‘No he turned the girl into a baby goat’

It has been argued that argument ellipsis is a viable analysis in these cases (Erguvanlı-Taylan 1984, Kornfilt 1987, 1997, Özsoy 1988, Turan 1995, Aygen 2001, Öztürk 2004, Şener and Takahashi 2010). In fact, Şener and Takahashi (2010) argue that a verb stranding ellipsis analysis in these cases is problematic. Similarly to Japanese, they show that the Turkish examples with a VP adjunct

do not get the adjunct reading, (60). That is, just pronouncing the verb and the subject leads to a reading where Phylis did not solve a problem at all, (60b).

- (60) a. Can sorun-u hızlı çöz-dü
 John problem-ACC quickly solve-PST
 ‘John solved the problem quickly’
- b. Filiz-se sorun-u hızlı çöz-me-di
 Phylis-however problem-ACC quickly solve-NEG-PST
 ✓ ‘Phylis did not solve the problem’
- ✗ ‘Phylis did not solve the problem quickly’

However, as was the case for Japanese, giving a specific context with an adverb has not been tested. That is, the sentences out of the blue do not receive the reading with the adverb. If we control for this, the adjunct reading is fully grammatical, (61). Thus, in a contexts where there is evidence of two Lego castles, it is completely fine to utter (61b), and can be followed up with remarks about how the lego castle looks.

- (61) Context: There are two Lego castles in the room
- a. Kız Lego-dan kaley-i dikkatlice yap-tı.
 girl Lego-ABL castle-ACC carefully build-PST
 ‘The girl built the Lego castle carefully’
- b. Oğlan Lego-dan kaley-i dikkatlice yap-ma-dı.
 boy Lego-ABL castle-ACC carefully build-NEG-PST
 The boy did not [build the Lego castle carefully].
- Follow up OK: in fact, it was missing pieces

I conclude that, at least in this case VSE is an option in Turkish, and not only argument ellipsis. Interestingly, there are constructions where argument ellipsis is not possible at all, (62). For example argument ellipsis cannot apply to object depictives or resultatives.. That is, it is not possible to get the interpretation that ‘Nigar is sad’ in (62a). However, this interpretation is possible in (62b), when apart from the predicate the object is also elided. Thus, based on the above data I argue that Turkish does have VSE in some contexts.²²

²²The data here regarding resultatives versus secondary predicates are also used by Gribanova (2020) in Uzbek. She

- (62) a. Ferhat Zehra'y-ı üzgün gör-dü ve Hasan Nigar'-ı gör-dü
 F. Z.-ACC sad see-PST and H. N.-ACC see-PST
 'Ferhat saw Zehra'y sad, and Hasan saw Nigar [but not sad]
- b. Ferhat Zehra'y-ı üzgün gör-dü mü? Evet, gör-dü.
 F. Z.-ACC sad see-PST Q? Yes, see-PST
 'Did Ferhat see Zehra'y sad? Yes he did [see her sad]

With this in mind, it is now possible to test the verbal identity requirement. For now I present some preliminary data, but more tests need to be presented in future work. Just like for Japanese, it is the case that the verbs need to match, (63). In this case there is a polar question with a resultative, which, according to (62a) has VSE and it is not possible to answer with a mismatched verb. With finite verbs the results are also pointing towards the adverb reading not being possible, but the intuitions are a bit hazier. (64, is a case with the context where someone heard noises from another room, and knew that it was a room full of lego, but they did not know what the noises meant; (65) shows that even with negation and a different verb it is hard to get the adjunct reading. Thus, in this case it meant that the castle was not broken down at all. Even if a context is provided where there is lego pieces all around the floor it is hard to utter (65) and it is preferred to pronounce the adjunct. However, more research is needed, because the sentences do not seem to be completely out, but the reading with the adjunct are very difficult to get.

- (63) a. Köpek havuc-u çiğken **çiğne**-di mi?
 dog carrot-ACC raw-while chew-PST Q
 'Did the dog eat the carrot while raw?'
- b.?*Yok **yut**-tu.
 no swallow-PST
 Intended 'No he swallowed it while raw'

- (64) ??*Kız dikkatlice lego-dan kale-i **yap**-tı sandım ama **yık**-tı.
 girl carefully lego-ABL castle-ACC build-PST thought but break.down-PST
 ✗'I thought the girl carefully built the lego castle, but she carefully broke down the lego castle'

shows that there are various other context where argument ellipsis does not apply (predicates of copular clauses and individual predicates of finite verbs), but VSE does apply. I am in the process of testing this, but Turkish seem to show mixed results in that it is possible to elide individual predicates, but not predicates of copular clauses. As is the case for Japanese this raises the question when one type of ellipsis can or cannot apply, especially since in Turkish (and Japanese) with finite verbs both argument ellipsis and verb phrase ellipsis seems to be allowed.

✓ ‘I though the girl carefully built the lego castle, but she broke it down (and it is now a mess)’

(65) ??*Kız lego-dan kaleyi-i dikkatlice yap-tı ama yık-ma-dı .
 girl lego-ABL castle-ACC carefully build-PST but broke-NEG-PST
 ✗ The girl carefully built the lego castle, but she did not carefully break it down’

✓ ‘The girl carefully built the lego castle, but she did not break it down’

To reiterate, both Japanese and Turkish have VSE as an option in their language. Crucially, in these contexts the verb needs to match with its antecedent. This fits with a larger cross-linguistic pattern for VSE and the verb identity requirement, since languages can differ in the requirements they impose on the stranded verb. There are languages that require their verbs to be identical in VSE constructions, and those that do not. This has been used, independently, as an argument for a split between syntactic movement of verbs, and head movement taking place at PF. Interestingly, the languages that I argue to have movement after material is sent to the interfaces only, based on their auxiliary patterns have the VSE-verb requirement that has been associated with this type of movement as well. This is important, since it is quite tricky to find evidence for one or the other type of movement in these languages, because they are strictly head final. However, Turkish and Japanese pattern with non-head final languages with regard to their identity requirement. Moreover, looking at matching restrictions on verbs in these ellipsis contexts is a way to test the assumption that head movement can take place before or after spell-out. This means that the mechanism I used to derive difference in synthetic and periphrastic forms in languages like Turkish versus Greek can be seen in other domains of grammar as well.

3.2.2 Extraction and domain size

This section briefly discusses potential correlations between movement before spell-out and extraction and movement patterns. If it is the case that movement can in fact expand the domain of the first phase, this should be visible in the syntax as well for other phenomena. This section focuses on two potential ways to test this, as discussed in the literature for other languages than those discussed

in the dissertation. I leave testing these predictions for the languages in the dissertation for future work. One argument comes from binding conditions in particular word order patterns in Spanish, which pertains to the verbal domain. A different argument comes from extraction patterns in the DP domain. One issue is that there is a lot of discussion regarding the status of the internal verbal boundary and if it exists at all (see Kang 2014, Keine 2017). Moreover, testing extraction in this domain is difficult, since when it has a syntactic effect, it is usually a landing site for material, such as *wh*-elements moving to a higher position (Chomsky 1986, 2000, van Urk and Richards 2015, a.o.). However, there can be an effect with regard to movement, which I show for Spanish. For extraction I look at the DP domain and affixal-article languages.

One prediction that is made with regard to different types of movement has to do with variation of extraction possibilities. That is, if a phrase counts as a syntactic opaque boundary, movement of the head of this phrase could potentially open up this domain for extraction. If on the other hand the head remains a boundary, and a higher head is only combined at a later point, there should be no effect on extraction. Thus, there are two possibilities to get the same surface result and the first case relates to what has been called phase extension or phase sliding, and the second case is head movement after spell-out in this chapter. One such case that has the same surface results can be found in the DP domain where languages can have affixal articles. An example is given for Icelandic (Germanic), and Setswana (Bantu), (66). In both languages it is possible to form a complex word with a noun and a class marker or determiner.

- (66) a. handlegg-ur-in-n [Icelandic]
 hand.leg-nom.sg.masc-D-nom.sg.masc
 ‘the arm’ (pc. G. R. Harðarson)
- b. ma-gatwe
 C6-rumor
 ‘The rumor’ (Bošković 2018, p.44)

In the literature on these constructions there is a similar debate as discussed in this dissertation with regard to what type of movement accounts for this pattern: is there syntactic movement or does it involve a version of morphological movement. For both cases it has been argued that N-to-D

movement is a possibility (Carstens 2010, 2017, a.o., for the Bantu family; Sigurðsson 1993, a.o. for Icelandic); but it has also been proposed that the double inflectional marking in Icelandic is indicative of the determiner being more clitic-like and not involving syntactic movement (see for an overview Lohrmann 2010). The prediction is now that if both have the same analysis, they should pattern the same with regard to extraction patterns, but if they involve different mechanisms they should pattern differently. There is some preliminary data that suggest Icelandic and Setswana involve different type of movement.

It has in fact been noted that there is a difference in extraction patterns across different affixal-article languages (Bošković 2018). The extraction patterns relate to the Complex NP-constraint. In English for example, it is generally not possible to extract out of a complex NP. What is of interest is that there is an asymmetry between Icelandic (Germanic) and Setswana (Bantu). Both languages have articles as affixes, but Icelandic patterns with English with regard to not being allowed to extract, whereas this extraction pattern is possible in Setswana, (67).

- (67) a. *Hvað_i heyrðir þú orðróm-inn um [að Jón hefði keypt t_i]?
 what heard you rumor-DEF about that Jón have.S.PST bought
 Intended: ‘What did you hear the rumor that Jón bought?’ (Bošković 2018, p.45)
- b. ke m-ang yo o utlw-ile-ng ma-gatwe a gore ntsa e lom-ile
 it C1-who C1rel 2sgSM hear-PRF-rel C6-rumor C6SM that C9-dog C9SM bite-PRF
 ‘Who did you hear rumors that a dog bit’ (Bošković 2018, p.44)

If this pattern is on the right track, it would mean that there is movement in the syntax in Setswana, expanding the phase, and voiding the domain effect. It is surprising if the exact same N-to-D movement operation holds in both languages. It does not mean that necessarily in Icelandic it involves movement after spell-out, or in the morphology, since there might be intervening factors such as definiteness effects (Bošković 2018). However, if the way the affix gets onto the noun follows from timing differences in movement, the pattern in the different languages could be explained. Thus, what is important here is that different timing of movement makes predictions for extraction patterns, even in other domains than the clausal domain. In this case, the DP domain shows similarities to the verbal domain discussed here. On the surface there is a similar output, i.e.,

a noun with an affixal determiner, but this does not mean that these patterns are derived in the same way. Crucially, it might be possible to test this independently.

Second I look at another argument for verbal-phase sliding. This argument comes from (Gallego and Uriagereka 2007a,b,c, Gallego 2010) and binding of the object into the subject. In Spanish, it is possible to have the following VOS sentence (68), where the object *each car* can bind into the subject.

- (68) Recogió cada coche su propietario [Spanish]
 pick.up-PST-3.SG each car its owner
 ‘Its owner picked up each car’ (Gallego and Uriagereka 2007b)

According to Gallego and Uriagereka (2007a) this binding fact indicates the following. They assume that in order to have the object bind the subject, there must be A-movement. They argue that the verb moving to T is the mechanism that allows for the phase to slide, making the V+v+T complex act as a phase, and making A-movement possible. Interestingly, they show that this movement of the object is not possible as soon as V-to-T movement is blocked, for example when there is an auxiliary. This is shown in the following examples. Thus, the base sentence without movement is fine, (69a), but as soon as the object is moved this sentence is ungrammatical, (69b).

- (69) a. [_{TP} Ayer esteba [_{vP} Isabel leyendo un libro]] [Spanish]
 yesterday be-PST-3.SG Isabel reading a book
 ‘Yesterday Isabel was reading a book’
 b. * [_{TP} Ayer esteba [_{vP} un libro [_{vP} Isabel leyendo t_{unlibro}]]] [Spanish]
 yesterday be-PST-3.SG a book Isabel reading

The crucial point here is the difference between the verb having moved or not and possible VOS orders. It might be that the structure for the progressive auxiliary is different (see Cinque 2017 for various different constructions for the progressive that are not necessarily verbal, and Ch. 5 Sec. 5.2.2.2), but the verb at least has not moved, which means no object movement is possible. Thus, the testable prediction is the following. When a language has movement before spell-out, and it allows VOS orders the pattern should look as follows: there is still agreement between the verb and the subject, and the object can be structurally higher than the subject.

To summarize, I have presented two ways of testing the effects of head movement before spell-out. One has to do with the verbal domain and the difference between V-to=T movement and the lack of this movement in relation to particular word orders, and the other argument comes from a different domain, namely noun phrases.

3.2.3 Previous arguments in Japanese for Head Movement in syntax

This last section that discusses the status of head movement before or after spell-out focuses on two arguments in Japanese that have been put forward as arguments in favor of movement before spell-out. I show in the following two subsections that the facts can also be analyzed in a different way.

3.2.3.1 Do Support

An argument for the difference between movement before or after spell-out comes from the distribution of rescue operations in the verbal domain. In this case I consider a specific claim in Japanese as evidence for syntactic head movement of V-to-T, and argue that it is possible to analyze this as a case of PF movement. As such, since it is not possible to show conclusively that this involves syntactic movement, it is not evidence against the analysis presented here.

In case of fronting of a VP constituent in Japanese, it has recently been argued that there is an argument in favor of syntactic movement, but I show that this does not necessarily have to be the conclusion. This is mostly based on the fact that the only analytical possibilities entertained in the data below are verb movement or no verb movement. However, There is evidence in the literature that Japanese allows fronting of a phrasal constituent that seems to correspond to a VP (Funakoshi 2020). However, there are certain restrictions on this constituent, this is shown in (70). The baseline sentence is given in (70a), where the subject precedes the VP including the object and the verb. Note that if the verb were to stay in the VP, the structure would mean that the tense affix is outside of the VP, as depicted. Fronting this VP is ungrammatical, (70b). This could be due to the fact that the past marker is stranded, but supporting it with an auxiliary does not make the

sentence grammatical, (70c). What does make the sentence grammatical with the predicate fronted, is do-support and a focus particle attached to the verb or VP, (70d).

- (70) a. Kaonashi-ga [_{VP} aogaeru-o tabe] ta
 No.Face-NOM Aogaeru-ACC eat PST
 ‘No Face ate Aogaeru’
- b.*[_{VP} aogaeru-o tabe] Kaonashi-ga *t*_{VP} ta [VP-fronting]
 Aogaeru-ACC eat No.Face-NOM PST
- c.*[_{VP} aogaeru-o tabe] Kaonashi-ga *t*_{VP} si-ta [do-support]
 Aogaeru-ACC eat No.Face-NOM do-PST
- d. [_{VP} aogaeru-o tabe-**sae/mo/wa/dake**] Kaonashi-ga *t*_{VP} si-ta [particle]
 Aogaeru-ACC eat-even/also/TOP/only No.Face-NOM do-PST
 ‘No Face even/also/only ate Aogaeru’ based on (Funakoshi 2020)

This data has been taken as evidence that there is verb movement out of VP when there is no fronting and no particle (Funakoshi 2020). The argument is that if the verb were never moving out of the VP, it is expected that do-support always is necessary for the past tense marker. This is not the case, however, as the example in (70a) shows, where there is no ‘do’. This thus means that, according to this line of reasoning, the structure is in fact different, and *tabe* is not part of the VP, but has raised to the T head.

However, the fact that there is do-support is not by itself an argument for syntactic raising to T. In fact, for English this argument has been used as an argument against lowering (or affix hopping) of the tense morpheme onto the verb (Chomsky 1957). As a first description of the distribution of do-support, consider the examples in (71). A tense morpheme can combine with the verb when no material intervenes, (71). When there is negation, it is not possible to combine the verb with the tense morpheme, nor is it possible to express the morpheme in a higher position, (72b). In order to pronounce this, the tense head is hosted by an auxiliary, *do*, (72c).

- (71) Ziggy Stardust [**play -ed**] guitar with his left hand
- (72) a. *Ziggy Stardust not [**play -ed**] with his right hand
 b. *Ziggy Stardust [**-ed**] not [**play**] with his right hand
 c. Ziggy Stardust [**did**] not [**play**] with his right hand

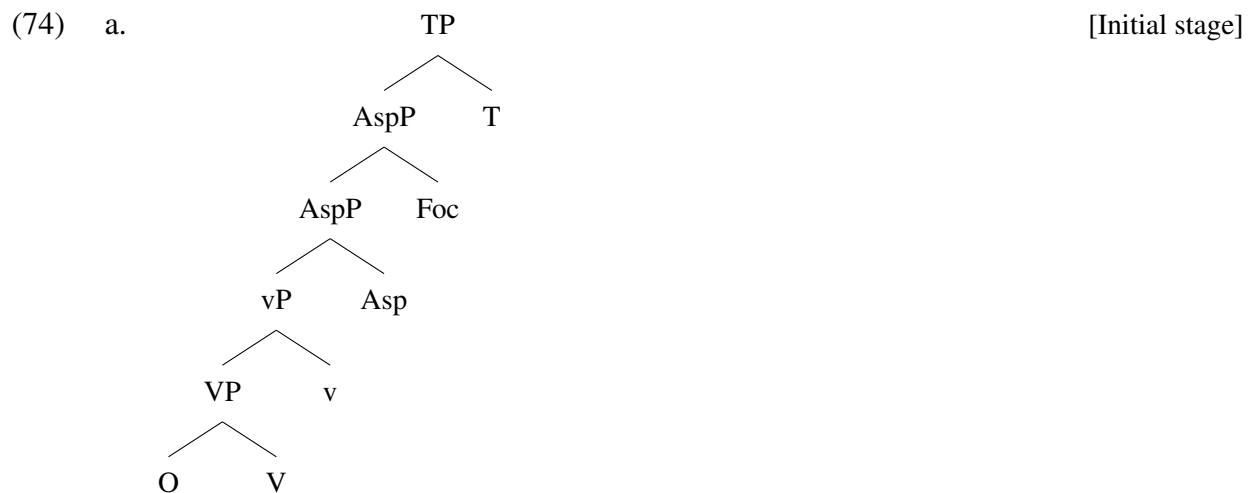
This type of data has been taken to mean that *do* is inserted as a rescue operation, because the tense morpheme cannot be expressed by itself, since it is an affix and needs a host (Chomsky 1957, 1991, Lasnik 1981, Pollock 1989, Halle and Marantz 1993, Bobaljik 1995, Embick and Noyer 2001). Other environments where the auxiliary is needed are in cases of emphasis, polar questions, non-subject WH-questions, VP ellipsis, and VP displacement, (73).

- (73) a. Ziggy Stardust DID play the guitar with his left hand *Emphasis*
 b. Did Ziggy Stardust play the guitar with his left hand? *Polar Question*
 c. What did Ziggy Stardust play with his left hand? *non-subject WH-question*
 d. Ziggy Stardust played the guitar with his left hand and Jimi Hendrix did too *VP ellipsis*
 e. Someone told Ziggy to play the guitar, and play the guitar he did *VP fronting*

For all these cases it has been argued that the relation between V and T is not possible, which means that *do* is inserted to rescue the tense head. However, there is a discussion if this is the correct description, and moreover, if this usage of *do* is needed in the syntax or at PF (Lasnik 1981, Halle and Marantz 1993, Bobaljik 1995, Bjorkman 2011, Arregi and Pietraszko 2019a). One of the arguments to put *do*-support in the PF component of grammar, is because there is an adjacency requirement: only when the negation intervenes between tense and the verb, is *do* inserted because the verb and tense cannot combine. Recently, it has been argued that this might not be the correct analysis of this phenomenon (Bjorkman 2011, Arregi and Pietraszko 2019a). Part of the criticism to these approaches is the fact that *do*-support is tightly linked to the absence of verb movement, and it predicts that languages with V-to-T movement do not have *do*-support at all. However, it has been shown that there are languages that have V-to-T movement, but also have *do*-support in cases where it is possible to establish a relationship between the verb and Tense. This has been argued for Mainland Scandinavian, Breton, and Monnese. Moreover, as Arregi and Pietraszko (2019a) show, it is possible for *do*-support to occur in different positions: in some languages *do*-support is necessary in the v-domain, as for example in Mainland Scandinavian, (Houser et al. 2011, Platzack 2012, Thoms 2012, Bentzen et al. 2013, a.o.), and in some languages it is tied to a higher head.

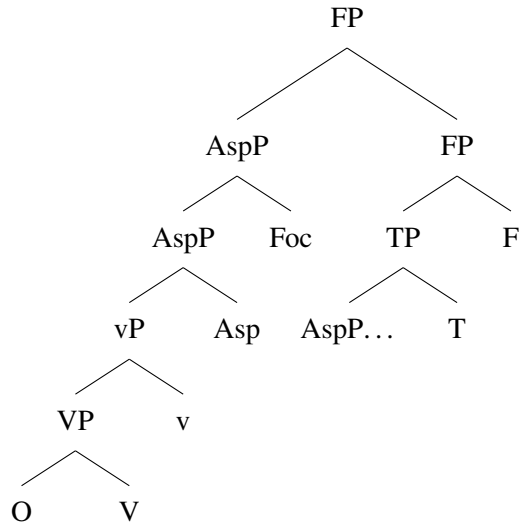
Even though it might be the case that not all cases of do-support can be accounted for as a failure of the verb and a specific head to be in the same complex head, it might still be the case that the cases where do-support occurs as in English might be a subset of all the cases of do-support.

My analysis for Japanese is as follows. I assume that the movement of the fronted constituent takes place before head movement, i.e. before spell-out. For now I assume that the focus particle is an adjunct attached to the phase, (74a), even though it could be the case that this focus particle is an indication of the fronted element being nominal (Saito 2006). I assume, with Harwood (2014) that aspect counts as a phase and that only phases can be moved (Svenonius 2005, Chomsky 2008, Fowlie 2013, Roberts 2010b). Thus, once the phase is built it is being fronted, (74b), for ease of exposition I assume it moves to FP, leaving aside the exact nature of this phrase. This fronted constituent is then spelled out, which means that head movement takes place. In this case, the syntactic word that is formed only contains the focus head and the verb, since the lower heads are pruned, (74c). When the second domain, including T is sent to spell-out, it cannot lower onto the verb, since it is not adjacent anymore, and as a rescue an auxiliary is inserted, (74d).²³

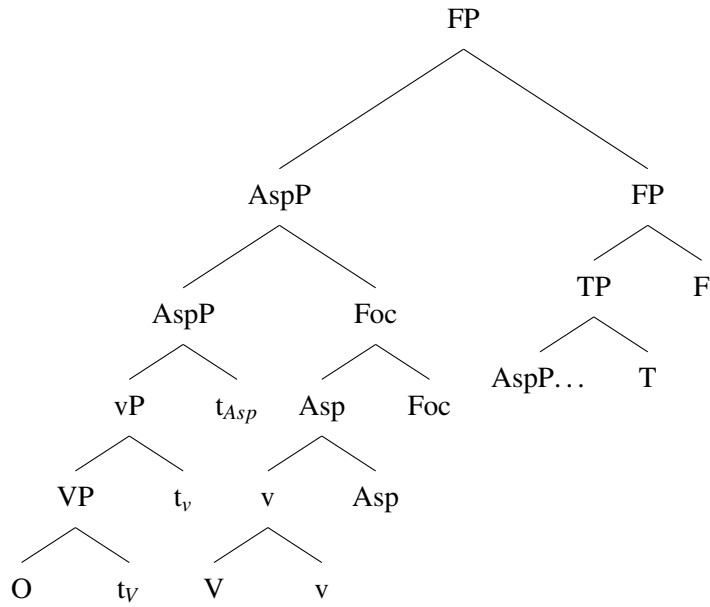


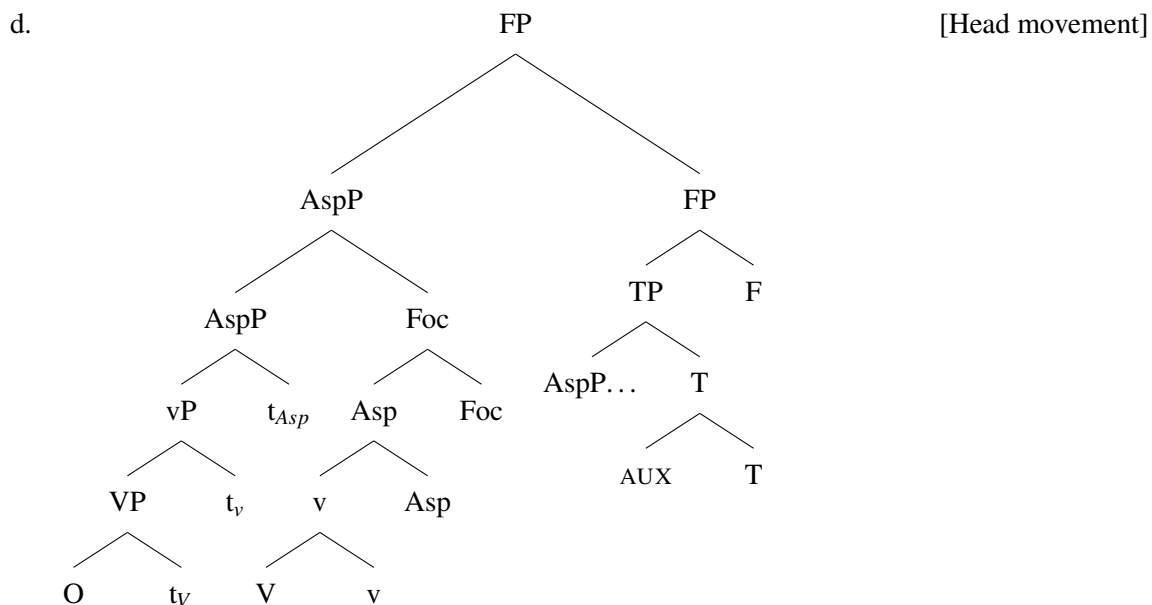
²³Since it is the case that there is do-support in this environment, it might seem surprising in light of the discussion in the previous section on VSE, that Japanese has VSE rather than do-support with VP ellipsis. In fact, Japanese does have this type of ellipsis as well (REFS). What needs to be sorted out, however, is when VSE and VPE applies in this language, and if this has to do with the size of the ellipsis site or if it is tied to specific syntactic constructions.

b. [Fronting]



c. [Head movement]





I assume this auxiliary is *do* rather than *be (/i/)*, is because I assume that *do* is the default auxiliary, and ‘be’ is inserted when the Aspectual phrase carries [+prog]. I argue that the auxiliary can be sensitive to this distinction, because, even though the head is not present anymore (since it has moved), it is still local enough to the top most node of the AspP.

This then means that even though there is *do*-support, it is not necessarily the case that this involves syntactic movement.

3.2.3.2 Multiple Scrambling

The last argument discussed in this chapter that has been put forward in favor of syntactic movement of the verb in Japanese has to do with multiple scrambling contexts with regard to the so-called headless vP-fronting analysis, as proposed by Koizumi (1995, 2000). I show, following (Sauerland 1996, 1999, Fukui and Sakai 2006, Agbayani et al. 2015) that this type of movement does not necessarily involve movement of the verb into T before spell-out, but rather involves movement after spell-out. The section will review the arguments regarding this type of analysis, since it is important to assess the claims regarding possible pre-spell-out movement of the verb to T.²⁴ Before showing the arguments against verb movement, I explain the rationale behind the movement approach, which

²⁴Julien (2002) provides evidence as well against a movement approach as proposed by Koizumi (1995), Nakajima (1999) regarding cleft constructions and coordination.

requires some explanation regarding scrambling restrictions in Japanese.

Japanese allows the movement of a constituent to clause initial position, which is called scrambling (ichi Harada 1977, Inoue 1978). An example is given in (75), where the object of the embedded clause is pronounced in initial position. The scrambled material is underlined.

- (75) sono mame-o Mei-ga [Totoro-ga Satsuki-ni ~~sono mame-o~~ watasita to] omotteiru koto
 that bean-ACC M-NOM T-NOM S-DAT that bean-ACC handed C think fact
 ‘Mei thinks that Totoro handed that bean to Satsuki.’ Based on (Agbayani et al. 2015, p.48)

This type of data has been analyzed as a type of syntactic movement, since the movement is sensitive to islands (Saito 1985, 1992). In case of movement of multiple XPs, it is not possible to do this in the same way as scrambling a single XP as in (75). Thus, the equivalent of (75) with the dative also moved yields ungrammaticality, (76). The sentence, however, becomes grammatical when the indirect and direct object are phrased together prosodically, (77) (Koizumi 2000, Fukui and Sakai 2006, Agbayani et al. 2015).

- (76) ?*Satsuki-ni sono mame-o Mei-ga [Totoro-ga Satsuki-ni ~~sono mame-o~~ watasita to]
 S.-DAT that bean-ACC M-NOM T-NOM S-DAT that bean-ACC handed C
 omotteiru koto
 think fact
- (77) (Satsuki-ni sono mame-o) ϕ (Mei-ga) ϕ (Totoro-ga Satsuki-ni ~~sono mame-o~~ watasita to) ϕ
 S.-DAT that bean-ACC M-NOM T-NOM S-DAT that bean-ACC handed C
 (omotteiru koto) ϕ
 think fact
 ‘Mei thinks that Totoro handed that bean to Satsuki.’ Based on (Agbayani et al. 2015, p.49)

In order to account for this type of data, especially the fact that the DO and IO need to be pronounced as a single prosodic unit, it has been proposed that the verb moves out of the VP, (78b) after which the VP gets fronted without the head, (78c).

- (78) a. [S [IO DO V] T]
 b. [S [IO DO ∇] V+T]
 c. [[IO DO ∇] S [~~IO DO ∇~~] V+T]

In this analysis the IO and DO form a single constituent when they are fronted and can then be translated into a single prosodic unit. Crucially, in order for the DO and IO to be a single constituent, the verb needs to have moved out of the VP. Additional evidence that there is a single constituent comes from the fact that it is not possible to put intervening material between the IO and DO (Hiraiwa 2010). This then points to the analysis put forward by Koizumi in (78). Moreover, apart from the prosodic evidence, there is also syntactic evidence that the IO always remains structurally higher than the DO (Agbayani et al. 2015, Arano 2017a,b). Evidence comes from scope facts and binding. For example, the scope relations that are established in situ remain the same when both IO and DO are scrambled. This is not surprising under the analysis in (78), since both IO and DO remain inside the phrase. However, under an analysis where both XPs move separately, it could be expected that the scope relation alter, contrary to fact.

All this evidence, I believe, points at least to scrambling of separate XPs not being possible, since it is not possible to break up the prosodic unit, nor do the scope and binding facts presented in the literature point to this analysis. However, I follow Fukui and Sakai (2006) and Agbayani et al. (2015) in that this does not mean that there is syntactic V-to-T movement and syntactic movement of the IO and DO within the VP. This is because of the following facts. As (79) shows, it is possible to move parts of the VP, namely the IO and a locative VP, but keep the DO in situ. In this case the scrambled XPs do need to form a single prosodic phrase.

- (79) (Masami-ni Hawaii-de) ϕ John-ga [Kiyomi-ga purezento-o katta to] omotteiru koto
 Masami-DAT Hawaii-in John-NOM Kiyomi-NOM present-ACC bought C think fact
 ‘John believes that Kiyomi bought a present for Masani in Hawaii’

In this case, it is a non-constituent that is at the front of the clause, and not the whole VP, since the DO remains in situ. Crucially, this is acceptable only when the fronted XPs are a single prosodic phrase. Fukui and Sakai (2006) take this type of evidence to point to the scrambling analysis where each XP is fronted separately. However, as discussed above, this analysis faces serious problems. I follow Sauerland (1996, 1999), Agbayani et al. (2015) in that these multiple scrambling fact can be analyzed as instances of prosodic movement, rather than syntactic. In the system here, this then is equivalent to verb movement taking place before or after material is sent to spell-out: in this

case phrases can be moved after spell-out as well. It might well be that single scrambling involves movement before spell-out, but I follow Agbayani et al. (2015) in that multiple scrambling at least involves movement after spell-out. They propose to do this in a framework where syntactic material is first mapped into prosodic structure. The gist of their analysis is as follows. They follow the general approach presented in (Ito and Mester 2013), where in Japanese generally a single XP maps into a single ϕ . However, they propose that in some cases it is possible to have a recursive ϕ . This is in cases where there is scrambled material that involves more than a single constituent, since they assume a constraint on scrambled material is that it always forms a single prosodic domain. When there are multiple elements that do not form a constituent, they propose a prosodic operation that can pack a multiple ϕ -domains into a single one, and this ϕ -domain can be moved to the beginning of an intonational phrase, ι . This is schematically represented in (80), where the syntax (first line) has both NP's in situ, but during spell-out these two NPs can be mapped onto a single phrase and moved to the front, represented in the second line.

$$(80) \quad X \dots Y \dots Z \dots \quad [NP-DAT] \quad [NP-ACC] \\
\quad \quad \quad \left((\dots)\phi(\dots)\phi(\dots)\phi \quad \underbrace{((\dots)\phi \quad (\dots)\phi)\phi}_{\uparrow} \right) \iota$$

Under such an analysis it is not necessary to have syntactic verb movement, nor does this go against any of the syntactic binding and scope evidence that the IO remains structurally higher than the DO. Crucially for the point being made in this chapter, this means that these data do not provide conclusive evidence for there being syntactic verb movement. This is in line with the previous sections where I have provided evidence that the formation of verbs in Japanese is more in line with PF movement, rather than syntactic movement.

3.2.4 Summary and taking stock

This section explored various implications with regard to the timing of head movement in the syntax: before or after spell-out. First of all, I showed that this timing difference is used in the literature on

matching constraints of the verb in verb stranding ellipsis contexts. I showed that the two head final languages, Japanese and Turkish, I argued have movement after spell-out, pattern for VSE with the languages that have been argued to have movement after spell-out. Thus, the auxiliary patterns in these languages and the VSE patterns correlate. Second, I briefly discussed predictions for extraction and binding when a language has phase extension. I showed that this timing distinction between head movement and spell-out can also potentially be tested in other domains, such as DPs. Finally, I reviewed two arguments that were presented in the literature in favor of head movement before spell-out in Japanese and I showed that there is no conclusive evidence for that position. This means that the variation in auxiliary and synthetic patterns cross-linguistically can be analyzed as timing differences in head movement. Moreover, I have provided ways of testing this timing difference. Next I provide ways of testing other timing differences, and variation in how the same surface form can be derived.

3.3 Testing Predictions II: Head Movement in two cycles

The system here can derive the same surface form with different derivations. If that is the case, there should be additional evidence that points to different derivational histories. This will be the focus of this section, by looking at a different type of ellipsis, and matching conditions between inflectional material. Second, the I also discuss in 3.3.2 the relation between morphological form and verb height. Before this, I review what it means in this system to have different derivational histories.

An example for two different derivations to form a synthetic verb form is given in (3.16). In this example, a synthetic verb form can be derived on a single cycle or on two different cycles. The [1] derivation is one where there is a step of movement before spell-out, and all heads are put together in a complex head on the first cycle, and this is also interpreted in the phonology on the first cycle. The [2] derivation is one where first material is shipped to the interfaces, and thus head movement is blocked by the phase boundary and not all heads are together on the first cycle. Only on the second cycle do all heads combine. As shown in [G], the surface result for both derivations is a synthetic

verb form. There is a difference, in that with phase extension the verb form can carry all morphemes together, whereas in order for heads outside of the first cycle to be part of the morphological and phonological word in the other derivation [2], the phase head needs to be removed. As such, the verb carries less morphemes (i.e., specifically not the phase head and material outside of it together).

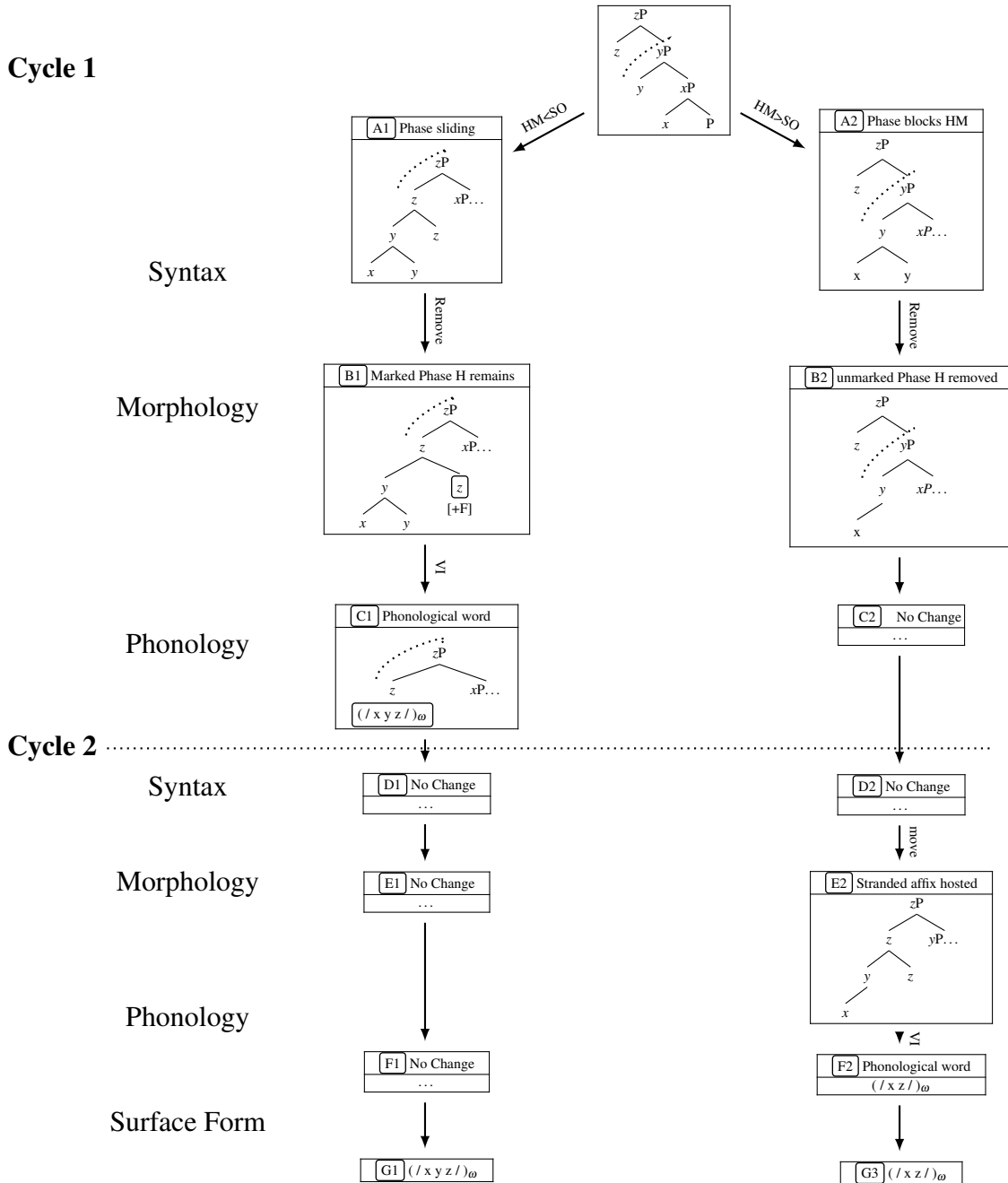


Table 3.16: Same surface form, different derivations

Data points that I discussed for the surface form in [G1] is Greek synthetic tense forms, but also forms in other languages with V-to-T movement such as French, Italian, or European Portuguese. Cases of the surface form in [G2] are synthetic tense forms in English, Turkish and Japanese. Specifically, the prediction is that there should be evidence that *z* remains separate from the verb form on the first cycle on the derivation in [2], whereas it does not in [1]. In other words, there should be evidence for T being separate on the first cycle in English, Turkish or Japanese, but together with the verb in French, Italian, Greek or Portuguese. This will be discussed in the following section 3.3.1 by looking at mismatches in ellipsis. Other than discussing only synthetic forms, I also provide what the predictions will be for other verb forms. Then, after this, I discuss the system presented here in relation to verb height.

3.3.1 Mismatches with VP ellipsis

One way to test if a head remains separate in the syntax, but not in the morphology or phonology, is by looking at mismatches in ellipsis. The reasoning is similar to the discussion on verb stranding ellipsis, but now the focus is on the TMA morphemes rather than the verb. I first explain how to test this, and then discuss what the predictions are for synthetic and periphrastic forms.

In VP ellipsis contexts, as opposed to the verb stranding contexts in Sec. 3.2.1, the verb is elided with the internal argument. An example is given below for English.

(81) Posh spice wanted to **buy** a black Gucci dress, and she **did** ~~buy a black Gucci dress~~

In this example, relating this back to matching, what is contained in the constituent [*buy a black gucci dress*] must match for the ellipsis and antecedent. Any material outside of it does not. Thus in this case the bare verb needs to match, but any material such as the auxiliary does not have to match. If VP ellipsis happens at the point of spell-out of the first cycle, then it means that elements that are outside of this cycle should not be part of the matching condition. This makes the following predictions, which differ whether a head is part of the verbal complex on the first cycle or not. Let us first focus on the derivation where there is head movement after spell-out. In this case, the output

of the first cycle is as in Table 3.17 for a marked and unmarked phase head.

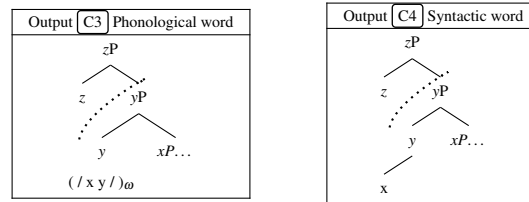


Table 3.17: Output First cycle for head movement after SO

In both cases *z* remains outside of the complex or phonological word on the first cycle, whereas *y* does not. Thus, in such a language, it is expected that *z*, irregardless of whether it ends up with the verb in a single syntactic or phonological word on the second cycle, should always pattern the same with regard to mismatches in ellipsis: That is, it is never subject to the matching condition. A head like *y* on the other hand should never be able to mismatch, since it is always part of the first cycle, and as such part of the matching during ellipsis.

A language that has VP ellipsis and head movement after spell-out (according to the proposal here) is English. In the previous sections I discussed various constructions, which are summarized in Table 3.18. The first two options have a phonological word in the output, namely the verb stem with the progressive. The latter two have an unmarked phase head, which has been removed and as such there are only syntactic complex heads present.

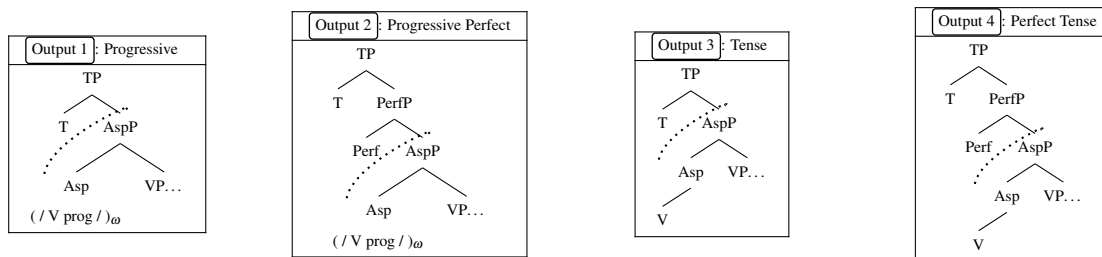


Table 3.18: Output First Phase for English

Recall that I assume that in case of 3-4 a synthetic verb form will be formed for the first head outside of the first domain, i.e., the tense head or the perfect head. However, even though their surface form is a synthetic form, just as the progressive is, the difference is whether the

synthetic verb form is formed on the first or the second cycle. Thus, all heads that remain outside the verb-word on the first cycle should be part of the matching conditions during VP ellipsis. That is, T and Perf should be able to mismatch, irregardless of whether T or Perf end up on the verb-word or not on the second cycle. The progressive on the other hand will always be together with the verb word on the first cycle, and as such should be subject to the matching condition during ellipsis. This is exactly the pattern that is found.²⁵

The data presented here come from Quirk et al. (1972), Sag (1976), Warner (1986) and Lasnik (1995b). First, I look at the progressive. Mismatches are allowed when the antecedent contains a progressive, but the ellipsis site does not. However, mismatches are ungrammatical when the ellipsis site contains the progressive but the antecedent does not, (PROGlasnik).

- (82) a. John was **sleeping** and Mary will **sleep**, too
 b. *John **slept** and Mary was **sleeping**, too
 c. *John will **sleep** and Mary is **sleeping** now
 d. *John won't **enter** the competition, but Peter is **entering** the competition
 (Lasnik 1995b)

I follow Harwood (2014) that this is expected when the progressive can be part of the phase, but higher material is not. The fact that (62a) is grammatical is because the antecedent is bigger than the ellipsis site, which does not contain the ellipsis. The fact that the remainder of (62) is ungrammatical, is because the antecedent does not contain the progressive. As such, the ellipsis site is bigger than the antecedent, since it needs to contain the progressive. This then leads to ungrammaticality. The fact that the perfect does not fit this pattern, is because it is recoverable, because it is outside of the first phase.

Interestingly, this pattern is different for both the Perfect and Tense. That is, both of these heads

²⁵The analysis used here to capture this data is similar to that of Lasnik (1995b), who also argues that in English verb forms enter the derivation as bare forms and are only combined with inflectional material via a form of affix hopping Chomsky (1957), Lasnik (1981), Halle and Marantz (1993) and Bobaljik (1994). However, Lasnik (1995b) points out that the progressive under an affix hopping approach leads to a problem, since it patterns different from the perfect and the tense morphemes. It is not a problem under an approach where the progressive is part of the first phase (following Harwood 2014, a.o), see also Ch. 4) and tense and perfect are combined with the verb on a second cycle.

can mismatch, both in synthetic and periphrastic forms. First the data for the Perfect is presented. Here it is grammatical to have non-identical antecedents and ellipsis sites, (63).

- (83) a. John may be **questioning** our motives, but Peter hasn't ~~questioned~~ our motives
 b. Peter **saw** your parents last week, but he hasn't ~~seen~~ your parents since
 (Lasnik 1995b)

The same pattern is found for tense. In (84) the verb in the ellipsis site cannot be past tense, and thus does not have to match the antecedent. The same holds for the reverse pattern where the elided part contains a past reading.

- (84) Scary Spice slept, and Posh Spice will too
 a. *Scary Spice **slept**, and Posh Spice will **slept** too
 b. Scary Spice **slept**, and Posh Spice will **sleep** too adapted from Lasnik (1995b)

To summarize, in a language like English, there is a split between Tense and Perfect versus the progressive, where the former two morphemes always can mismatch, but the latter never can. This can be explained if heads like Tense and the Perfect always remain separate from the verb stem in the first cycle, when ellipsis matching also takes place. The fact that the progressive behaves differently can be explained under the assumption that the progressive is part of the first cycle. This has also been discussed by Harwood (2014) and will also be discussed in more detail in Ch. 4, Sec. 4.2.

With this in mind, we can turn to languages where there is sometimes a single cycle to derive synthetic (tense) verb forms. Abstractly speaking the following patterns are possible. With a single head outside of the first cycle, z can be part of the verb-word on the first cycle if head movement before spell-out takes place to z as the first step of the derivation, [1]. However, when there are multiple heads, the first head outside of the first cycle is part of the verb word on the first cycle, but z remains outside of this verb-word, [2]. It could also be possible that z is the first head, but then any higher heads should not be part of the verb-word on the first cycle, [3].

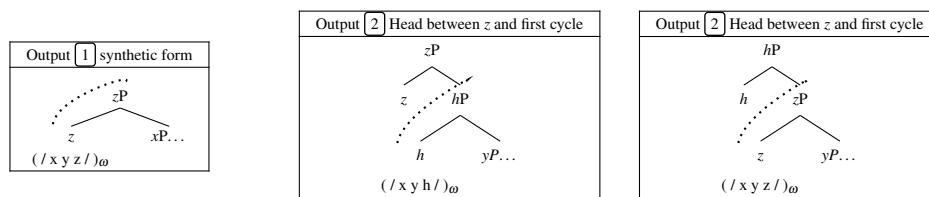


Table 3.19: Output First cycle for Head Movement before SO

Crucially, in such a language it is not the case that certain heads in this proposal are always part of one or the other cycle: they can be flexible depending on which heads intervene. Translating this to TMA heads, where z is T the following picture is predicted. When there are tense forms, [1], this can be derived on the first cycle, and as such the pattern should be similar to that of the progressive in English: mismatches should not be possible. However, other than for the progressive, in such languages Tense is not always part of the verb-word on the first cycle: In case there is a Perfect head, the perfect is part of the verb-word on the first cycle, [2], but tense is not. Thus, in these cases the tense morpheme should pattern like tense in English. The same holds for heads higher than T.

In order to test this, the language needs to have both movement to a higher position, and allow for VP ellipsis. Unfortunately, not many languages allow for this combination of constructions in their language. One language that might fit this pattern is European Portuguese, (Nunes and Zocca 2009, Cyrino and Matos 2002, 2005, Todorović 2016), but more work is needed to make the parallel complete.²⁶ The language allows for VP ellipsis when there are matching constituents, (85). This is possible when there is a perfect, progressive, or passive auxiliary. Only the perfect auxiliary is presented.

- (85) O João já tinha lido este livro, mas a Maria não tinha lido este livro
 the João already had read.PART this book but the Maria not had read.PART this book
 ‘João had already read this book, but Maria hadn’t (read this book)

(Nunes and Zocca 2009, 33)

Interestingly, mismatches are not allowed when the finiteness of the verb differs. This is for example shown for a pluperfect antecedent and a participial target, and a past and infinitival form,

²⁶The data here are only discussed to point to similarities and differences between English, and I leave aside the discussion regarding the richness of Tense for now.

(86).

- (86) a. *Ela perguntou se alguém lera o jornal,
 she asked if anybody read.PLPF the newspaper
 mas ninguém tinha lido o jornal
 but nobody had read.PRT the newspaper
 ‘She asked if anybody read the newspaper, but nobody had (read the newspaper)
 (Cyrino and Matos 2005, 14)
- b. *A Maria estudou muito, mas o João não vai estudar muito
 the Maria studied much but the João not goes study.INF much
 ‘Maria studied very hard, but João will not (study very hard) (Todorović 2016, 28)

Crucially, this is a different pattern than found in English before, where a mismatch with the perfect reading is allowed (83b), and the past is allowed to mismatch too, (84). One way to explain this pattern is by assuming that European Portuguese has movement before spell-out, which means that the Perf and T heads are already part of the spell-out domain. In English on the other hand, T and Perf are never part of the first phase, and therefore do not have to obey the matching condition. As noted, this is only a small set of data, and it is important to look at other languages as well, especially the languages I argued in this dissertation that have movement before spell-out. Moreover, it will be interesting to see if tense can mismatch if there are auxiliary patterns. I leave this for future work, also because the languages might not have this particular test available.

To conclude, I showed how it is possible to test whether a verb is derived via a single or two step derivation by looking at mismatches in inflectional categories in ellipsis. More work is needed to complete the paradigm in languages where mismatches are disallowed for Tense, but I have shown in this section what the predictions are.

3.3.2 Syntax-Morphology mismatches and verb height

At first sight it might seem like the system here does not make any predictions about verb height, or about auxiliary patterns. This section shows that there are such predictions. As will become clear, there are one-way correlations, and pertain mostly about multiple morphemes, rather than a single morpheme. I first discuss the main diagnostics for verb movement and verb height, and then discuss

why the system here does not make predications about those sentences. However, when including more aspectual distinctions, predictions are possible.

One of the main diagnostics used to determine height of an element in the clause is the use of adverbs or negation. This difference was first pointed out between English and French for how high the verb moves (Emonds 1978, Pollock 1989, among many others). The data below present English and French patterns for both negation and a VP adverb. In English the verb does not pass negation or the adverb, (87), whereas it does in French, (88).

- (87) a. Scary Spice ✗{ likes } not ✓{ likes } Dogmatix.
 b. Scary Spice ✗{ kisses } often ✓{ kisses } Baby Spice [English]
- (88) a. Asterix (n') ✓{ aime } pas ✗{ aime } Idéfix.
 Asterix NEG love NEG love Dogmatix
 'Asterix does not love Dogmatix'
- b. Obelix ✓{ embrasse } souvent ✗{ embrasse } Idéfix [French]
 Obelix kisses often kisses Dogmatix
 'Obelix often kisses Dogmatix' (Pollock 1989, adapted p.367)

These data have been accounted for by arguing that the verb in French moves to a higher position, whereas in English it does not. The system here does not make such a direct assumption: I argued that either verbs move before spell-out, and this can, but does not have to, lead to phase extension. Thus, it can mean that there is movement before spell-out, but that the movement is lower than the phase boundary. Conversely, it can be the case that the verb moves after material is sent to spell-out, but then in the second phase T and the verb can still form a complex, by either T lowering on V or V moving up to T. A way to distinguish between these options was discussed in the previous sections with regard to mismatches in inflectional features in ellipsis contexts.

So, what are the predictions in relation to movement, if there are any? Simple tenses are not going to give the answer, because simple tenses can be derived in different ways. What is important, is to look at the full TMA paradigm of a language, and crucially how many TMA features can be expressed in a single syntactic and phonological word.²⁷ The following data are important. In

²⁷Moreover, as Ochi (1999) points out, adverb tests might also not be as reliable in English for verb height, since in ellipsis contexts with a perfect auxiliary, a VP adverb can show up in a higher position.

English there is a periphrastic construction for viewpoint aspect and tense, whereas this is not the case for Greek. In this language, the form in (101) forms a phonological and syntactic domain (Philippaki-Warbuton and Spyropoulos 1999, Joseph 2002, Sims and Joseph 2019).

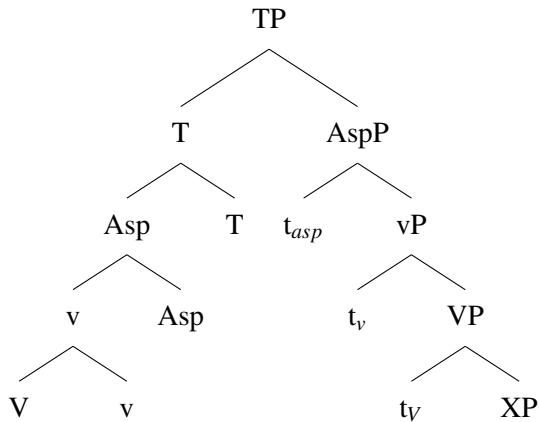
- (89) a. I [was] [eat -ing] [English]
 b. [é -tro -a] [Greek]
 PST -eat.IPFV -1.SG.PST
 ‘I was eating / I used to eat’

The crucial point here comes from Greek: The verb form includes tense and aspect in a single phonological and syntactic domain. This verb-word cannot be split up. As was done in the previous chapter for Japanese and Turkish verb forms, it is not possible to put intervening elements between any of the morphemes. Even though it is possible to put an adverb in between an auxiliary and the main verb, this is not possible in between the past marker and the verb, (90b). Even negation or object markers are not grammatical between tense and the verb stem, (90c).

- (90) a. [exi] **idhi** [fai]
 AUX.PST already eat.PART
 ‘Had already eaten’
 b. *[e] **idhi** [fa]
 PST already eat.PFV
 c. *[e- [**to=** [γraps -a]]]
 PST it.ACC write -1.SG.PST

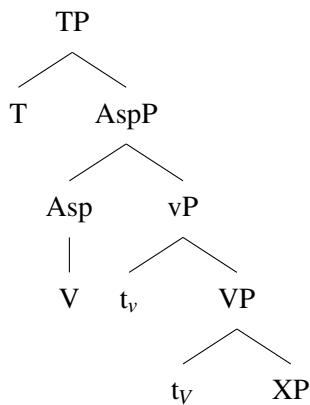
Thus Greek has a different pattern from English, Turkish or Japanese: it allows more inflectional markers on the verb. The only derivation in the system here that can account for it is one where there is verb movement before material is sent to spell-out, and this verb movement leads to phase extension, (91). Crucially, when head movement would take place after material is sent to spell-out, the only way to get material from a higher phase onto the verb is by removing the phase head. Thus, this would always mean that V-ASP-T should not be visible, (92).

(91) Phase extension: Asp+T

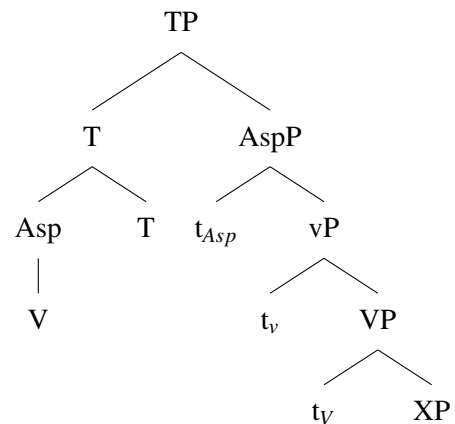


(92) HM>SO : *ASP+T

a. First Cycle: remove Phase.



b. Second Cycle: only V+T



Thus, the system here can account for the fact that a language like Greek has V-to-T movement (Alexiadou and Anagnostopoulou 1998, Alexiadou et al. 2015, Merchant 2018) by analyzing this as head movement taking place before spell-out. Note that this does not mean that all instances of V-to-T movement should be analyzed this way, since it can be done in multiple steps. Moreover, there is no bi-directional correlation for simple tenses and verb height since a higher or lower location of the verb can be derived in various ways. The only correlation that is predicted to hold in this system is when there are multiple morphemes on the verb, it must mean that there is pre-spell-out movement, and this predicts that the verb must occur higher in the clause; less morphemes can indicate various derivations. In Greek (or French as in the examples above) the

verb does indeed show up in a higher position, (93).

- (93) Itan safes oti to pedhi **ekapse** **epitidhes** ti supa
 It.was clear that the child burned.3SG intentionally the soup.ACC
 ‘It was clear that the child burned the soup intentionally’ (Merchant 2018, 232)

To summarize, if a language has a verb form that includes multiple morphemes from the higher phase, and the phase head, it must mean that this comes from head movement before spell-out. This then must also mean that there should be independent evidence for this type of movement. This was discussed in Sec. 3.2 in relation to verb stranding ellipsis and extraction patterns. This type of analysis is in line with the correlation presented in Bobaljik and Thráinsson (1998), in relation to the amount of movement a language can have and how many heads are present in the functional spine: having more morphology means that the verb has moved higher. Crucially, more here means not any type of morphology, but it means morphemes from the higher phase and the phase head from the first head.

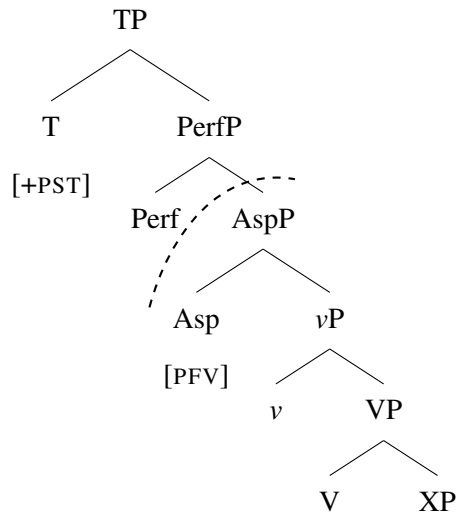
Moreover, this movement should also be present in auxiliary patterns. This is what was also discussed for differences in the perfect in Sec. 3.1. I argued that even though languages like Greek and English have both an auxiliary with the perfect, they are derived in a different way. In the following example various languages are presented with an auxiliary in the perfect, (94).

- (94) a. Topo Gigio [ha] [mangiato] una torta [Italian]
 Topo Gigio has eat.PART a cake
 ‘Topo Gigo has eaten a cake’
- b. o Oveliks [exi] [fai] ena guruni [Greek]
 the Obelix has eaten one pig
 ‘Obelix has eaten a swine’
- c. Obélix [a] [mangé] un sanglier [French]
 Obelix has eat.PART a swine
 ‘Obelix has eaten a swine’
- d. Baby Spice [has] [eat -en] a Chupa Chup [English]
 B. S. AUX.PRS eat -PRF a lollipop
 ‘Baby Spice has eaten a lollipop’

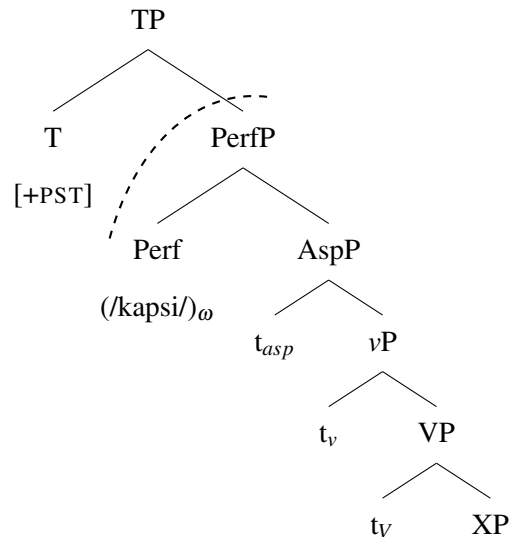
- e. Kedi farey [kova-la -mıŝ] [(i -di)] [Turkish]
 cat mouse chase -PRF AUX -PST
 ‘The cat has (had) chased a mouse’

The first three languages have evidence that the verb moves to a higher position than the latter two. Moreover, as discussed, English and Turkish never have Asp-T inside a single complex head, whereas the other languages can have. I argued in Sec. 3.1 that Greek and English have a different derivation: In Greek the verb always moves to the first head outside of the phase head, whereas it never does in English. Thus, when there is an additional head, like the Perfect, the verb will move to Perf instead of T, (95), but in English the first head only merges on the second cycle, and the first output is that Perf is not attached to V, (96).

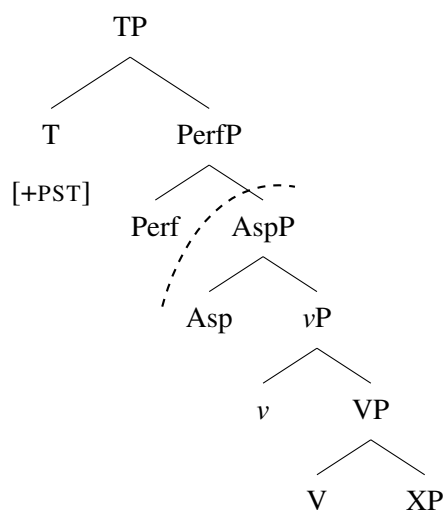
(95) a. Initial Stage



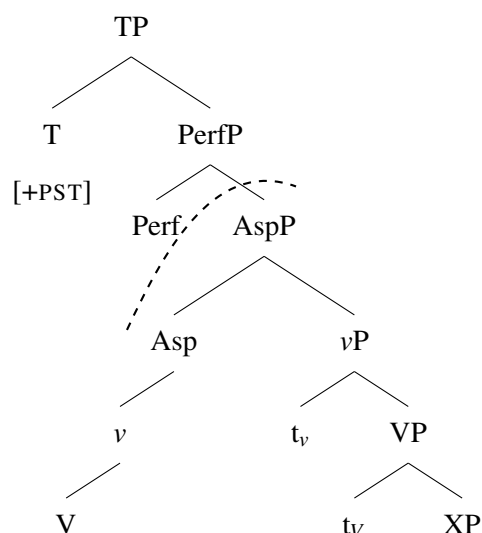
b. Final Stage



(96) a. Initial Stage



b. Final Stage



If it is the case that in Greek the verb moves to a higher position, even though it also has an auxiliary for the perfect like English, it means that there should be evidence that the verb also moves to this higher position. This is shown in the data below for Greek and English.

(97) Itan safes oti to pedhi **ixe** idhi **kapsi** **epitidhes** ti supa
 it.was clear that the child had.3SG already burned.PART intentionally the soup.ACC
 ‘It was clear that the child had already intentionally burned the soup’ (Merchant 2018, 232)

(98) Ginger Spice had already ✗{sewn } intentionally ✓ { sewn } the British flag on her Gucci dress.

Thus, the fact that both English and Greek have on the surface the same auxiliary pattern for the Perfect does not mean that they have the same derivation. As shown, even in auxiliary cases, even though the verb does not move to T, it does move to the first head above viewpoint aspect, Perf in this case in Greek, Italian and French. In a language like English the movement of the verb still stops in the same position as before. Thus, this means that in this analysis, it is not the case that languages like Greek should be classified as V-to-T movement languages, but rather, as ‘V-to-first head outside of the phase’ languages. In this type of analysis, the introduction of the Perfect head blocks head movement to T in some languages that generally have head movement to T. It is not the

case that in these languages head movement is ‘shorter’, because it still ends up in the first head above viewpoint aspect. The only difference is that in some cases there might be an additional head present. The cause of auxiliaries is different in a language like English, because the verb never moves higher than aspect to begin with, but can have in some cases a single step of lowering of the first head above this: in case of T this is the tense morpheme, in case of Perf this is the Perfect morpheme. Moreover, it also means that in a language like Greek there should be evidence for a synthetic form of V-Asp-Perf, whereas this cannot happen in English. Again, it means that when there is more synthesis, the prediction is that the verb moves higher and that there is phase extension which should be testable independently, as discussed in Sec 3.2.

3.3.3 Summary

In this section I reviewed a different claim related to the proposal regarding the timing of movement, namely the fact that the same surface form can have different derivational histories. First of all, I discussed a way to test this difference by looking at identity mismatches in inflectional material. I showed that in English there is a difference between the perfect and tense on the one hand, and the progressive on the other hand. I argued that this is evidence for the approach here, in that the progressive is part of the first phase and is already interpreted as soon as material needs to be matched for ellipsis. Tense and the Perfect on the other hand, do not combine with verbal material until later in the derivation. I contrasted this with data from European Portuguese, a language with V-to-T movement and have shown that the data are different than for English.

Second of all I discussed predictions regarding verbal morphology and verb height. I have shown that there is a one way correlation in that when there are more morphemes on the verb for both a syntactic and phonological word, there should be evidence for phase extension and movement out of the phase before spell-out. Having a simple tense for does not give evidence for verb height, since there are various options to derive these forms in the system proposed here.

3.4 Testing Predictions III: Syntax and its interfaces

This last section deals with the relation between word building and mismatches at the interfaces. I focus on predictions with regard to morphological and phonological operations. The previous section already dealt with mismatches between morphology and syntax, by discussing simple tense forms that can be derived in various ways. Crucially in English, verbs are separate from inflectional material in the second phase, whereas this is not the case in a language like Greek. Thus, to reiterate, there are three places in the derivation that morphemes can be joined together. This is summarized in table 3.20.

	Syntax	Morphology	Phonology	
HM<SO	[V Asp T] _{x⁰}	[V Asp T] _{x⁰}	(étroa) _ω	Greek
HM>SO	[V] _{x⁰} [T] _{x⁰}	[V T] _{x⁰}	(went) _ω	English
HM>VI	[V Asp] _{x⁰} [T] _{x⁰}	[V Asp] _{x⁰} [T] _{x⁰}	((kal'iyor) _ω du) _ω	Turkish

Table 3.20: Overview of Head movement and mismatches

When the verb already is joined with all the morphemes on the first cycle, through head movement before spell-out, it means that there will be a single unit in the syntax, the morphology, and the phonology. However, it is possible that head movement applies after spell-out, in which case material in higher phases remains separate on the first cycle in the syntax. Thus, for example in English, simple tenses form a single morphological and phonological word, but they do not form a single syntactic unit. Finally, I also discussed cases where material is only combined after (partial) vocabulary insertion, as for example in Turkish. This means that in the syntax and the morphology the units stay separate, but they are joined only at the last stage.

If this is correct, there are various predictions that can be made. Several have been discussed in the previous sections already. For example, I provided evidence that there is a step of head movement before spell-out in Greek, but not in English or Turkish. Thus, I already discussed the split in the syntax for these languages. One thing I did not discuss yet is the fact that in English and Greek the morphological and phonological unit for a simple tense should behave the same. That is, if both languages, even though different in the syntax, have the same morphological and

phonological processes, the same effects should be visible. One such operation would be suppletion, which is discussed in the next subsection. Second, this also makes predictions about phonological interactions and mismatches between phonology and syntax, discussed in (3.4.2).

3.4.1 Morphological interaction: Suppletion

As mentioned with regard to table 3.20 Greek and English simple tenses, even though different in the syntax, should behave the same in the morphology, i.e., for operations that pertain to a complex head. One such operation would be suppletion or allomorphy. The exact locality conditions for allomorphy and suppletion are open for discussion, (Bobaljik 2012, Bobaljik and Harley 2017, Moskal 2015, Merchant 2015, Fenger 2018, Thornton 2020, Gouskova and Bobaljik 2020, a.o.), but in most cases the locality condition is that there should be no phrasal material intervening. This means the following predictions should hold. When T+V are together at a point in the derivation before both morphemes are spelled out, interactions should be possible such as the form of V can be influenced by T. This should not be possible when T and V remain separate, in for example periphrastic constructions. Moreover, even if T and V are joined in a phonological word, but this happens only after vocabulary insertion, suppletion should not be possible anymore on the assumption that this is only possible inside a single X^0 .

Thus, this would mean that for both English and Greek there should be evidence for suppletion when T and V end up in the same morphological unit, but this should not be possible when T and V remain separate. Thus, in English, in synthetic tense forms it is possible to have suppletion of the verb stem, (99). But this suppletion disappears when it is not possible for T to join with V, for example in negation, (100). Thus, in this case the pattern is as in (100a) and not (100b). The same holds in Greek (C. Christopoulos, p.c).

(99) $[V + PST]_{X^0} = (went)_{\omega}$

(100) a. $[V]_{X^0} [Neg]_{X^0} [PST]_{X^0} \checkmark \rightarrow (did)_{\omega} (not)_{\omega} (go)_{\omega}$

b. $[V]_{X^0} [Neg]_{X^0} [PST]_{X^0} \times \rightarrow (did)_{\omega} (not)_{\omega} (went)_{\omega}$

Second of all, it means that suppletion should not be possible in the case of the third type of movement, where T only joins the verb after the verb is already spelled out. Since I argue that in cases where T moves after spell-out, this language should allow for the same type of suppletion patterns as in English and Greek, since I argue that the bigger phonological units are in fact periphrastic forms in the syntax. Thus, if a language allows for suppletion in a simple tense form, it should only be possible when T and V are moved together before they are spelled out.

3.4.2 Phonological Interactions

A different prediction that is made by the different movement operations is that when morphemes are already joined in the syntax, they should behave as a single phonological word. This does not have to be the case when morphemes are joined after spell-out. Thus, in Greek a synthetic tense form behaves as a single phonological unit (Philippaki-Warbuton and Spyropoulos 1999, Joseph 2002, Sims and Joseph 2019). The example is repeated from (89b) in (101).

- (101) [é -tro -a]
 PST -eat.IPFV -1.SG.PST
 ‘I was eating / I used to eat’ [Greek]

What is more interesting is that there does not have to be a single phonological unit when there is evidence in the syntax for multiple units. This is the case for movement after vocabulary insertion, in which case there should be syntax–phonology mismatches. For example, I discussed in the previous chapter for Japanese and Turkish that it is possible to show that cases of bigger phonological words can consist of various syntactic words underlyingly. I derived this by assuming that there is a step of head movement that merges the auxiliary onto the already spelled out verb. In case of Turkish, as repeated below, this means that no changes take place in the assignment of stress, but vowel harmony can still spread through the auxiliary and tense form.

(102) 2. Phase 2 Turkish

Morphosyntactic structure	
a. Auxiliary insertion	[(/kal'iyor/) _ω] _{ASP(+PROG)} [AUX T] _T
b. Local dislocation	[(/kal'iyor/) _ω AUX T] _T
Phonological grouping	
c. Vocabulary Insertion	[(/kal'iyor/) _ω /y/ /DI/] _T
d. Stress	n/a
e. Auxiliary form	[((/kal'iyor/) _ω /DI/) _ω] _T
f. Vowel Harmony	((/kal'iyor/) _ω /du/) _ω

As argued, this derives a form of cliticization, as also discussed in Shwayder (2015). In order to derive this type of pattern, I have assumed that the inner phonological word is spelled out first. That is, its key phonological properties are established on the first phase. Since vowel harmony is progressive in Turkish, the features of the already spelled out verb-unit can spread rightwards onto the suffixes of the next cycle, but the stress of the inner phonological word does not change. If that is the case, it predicts that morphemes that are attached on higher phases should not be able to alter the verb root. First I show what this would mean for languages with recessive vowel harmony, and then make a point about how the system here could shed light on prefix-suffix asymmetries. I like to point out a prediction regarding the direction of phonological processes, and which morpheme can influence another morpheme.

There are cases where vowel harmony does not always start from the verb stem, but can also start from an affix, influencing the root. These systems are called ‘dominant-recessive harmony’ systems, or in a directional approach to vowel harmony the value can spread either progressive or recessively. Crucially, in such a language the harmonic values can spread from one morpheme to another, and there is no limit as to the direction. An example is given in (103) for Kalenjin (Nilo-Saharan) (Hall et al. 1974, Hall and Hall 1980, Lodge 1995, Nevins 2010, Moskal 2015). In this language there is ATR vowel harmony, where a morpheme with a dominant value can spread throughout the rest of the morphemes. Using the notation from Moskal (2015), I represent the example as follows.

The morphemes that have underspecified phonemes and change depending on their context are represented in SMALLCAPS, and the morpheme that has a specified phonemes, including the vowel which gives its vowel quality to the other morphemes is represented in bold, without SMALLCAPS. The arrows, as was also the case for Turkish, indicate the direction of spreading. The output is given on the right. In this case the root ‘see’ can provide [+ATR] to prefixes and suffixes. Thus, in this case the vowel of the root ‘see’ remains the same and changes the quality of the inflectional morphology.

- (103) a. KI- A- **ke:r** → (kinger) (Hall and Hall 1980, 205, Hall et al. 1974, 247)
 PST- 1.SG.SUBJ- see
- b. KI- A- **ke:r** -IN → (kinger:in) (Hall et al. 1974, 247)
 PST- 1.SG.SUBJ- see -2.OBJ

There are also morphemes that are not specified, and in the absence of a dominant [+ATR] morpheme, all unspecified vowels surface with [-ATR], (104). When this is combined with a dominant affix, (105) the following happens. In this case [+ATR] from the aspectual suffix (glossed as progressive in Hall and Hall 1980 or continuous in Lodge 1995) spreads throughout the root and the prefixes. Thus, this is visible in the quality of the vowel of the verb stem in both cases.

- (104) KI- A- KER → (kiager) (Hall and Hall 1980, 205, Lodge 1995, 33)
 PST- 1.SG.SUBJ- shut
- (105) KI- A- KER -e → (kingere) (Hall and Hall 1980, 205, Lodge 1995, 33)
 PST- 1.SG.SUBJ- shut -CONT

Thus in this case, (105) an affix can influence the form of the root. This is not a problem under the approach presented here, since the verb stem and aspect can form a complex head, and a phonological word together. Vowel harmony then happens at the same time as in Turkish, during phonology. I leave open for now how the past is attached onto the verb-word, but as was also the case for Turkish, it is not a problem if past forms a single vowel harmony domain with aspect and the verb if it is contained in the same phonological word, as long as aspect+V also form a smaller syntactic and phonological unit.

Thus, it is not a surprise that a morpheme that is part of the lower phase can alter the verb root. The same is found in Tunen (Dugast 1971) where the causative morpheme can alter the

vowel quality of the verb root. Moreover, I have argued that a head from the higher phase, such as tense, can influence the form of the verb stem if it is the sole affix on the verb (in a language that has movement after spell-out), such as the suppletion patterns discussed in the previous sections. However, the system here predicts a gap: if a language has the same type of movement as Turkish or English (after spell-out), tense and aspect can never end up in the same *syntactic* word. If that is the case, Tense can never alter the phonological form of the verb stem when there is an overt aspectual morpheme. Thus, the system proposed here predicts that a language like Kalenjin-prime with PST being a dominant affix (setting aside the question of the prefix-suffix alternation) cannot influence the form of the root and the aspectual morpheme. In other words, a pattern like (105) where it is the past morpheme and not the continuous marker that is dominant should not exist. I leave testing this prediction for future work.

Thus the proposal here makes the prediction that for cyclic phonological processes in a language, affixes cannot alter the form of the verb anymore, when they are attached to material that is already spelled out. Interestingly, there is in fact the observation that prefixes are frequently more separate from the verb stem than suffixes, and often do not influence the form of the stem (Booij and Rubach 1984, Vogel 1989, Bobaljik and Wurmbrand 2001, Julien 2002, Hyman 2008, Moskal 2015, a.o.). This has also been discussed in relation to resolutions in lexical stress patterns, and the fact that there seems to be a prosodic domain that can be frozen after a certain amount of elements (Bogomolets 2020). Under the approach taken here it might be expected that prefixes are syntactically in a higher domain, or alternatively are in a different syntactic configuration. The latter has been proposed by assuming that some prefixes are in a specifier position (see for an overview Bogomolets 2020). What needs to be determined if these patterns can be accounted for by assuming that they have an underlying syntactic structure that accounts for these patterns, or whether this is a purely phonological pattern.

To summarize, I discussed two potential phonological and morphological predictions that can be tested in this section, based on the proposal in this dissertation that movement can be timed at different stages of the derivation.

3.5 Conclusion

This chapter dealt with movement in various domains of grammar. It was proposed that instead of arguing that movement to build verb forms always takes place in a single component, word-building can take place at various stages. It thus argued that proposals for the different timings are complementary to each other, rather than in competition, since languages might make different choices. First of all, I discussed various derivations for different movement options. I argued that the one operation that can feed or bleed movement operations at a later stage is the removal of unmarked heads. These two options—movement in the syntax, morphology or phonology, and removal of unmarked heads—give rise to many different surface forms. I have provided examples for most of those surface forms.

The second part of this chapter focused on providing evidence for the various stages of movement that I used to account for different synthetic and periphrastic verb forms. First of all, I focused on the assumption that movement can take place before or after spell-out. I used data from verb stranding ellipsis and extraction patterns to show that splits between languages can be accounted for by assuming that there are two timing moments for movement in the syntax. Moreover, I have shown that the data discussed in the previous chapter, the two head final languages Japanese and Turkish, pattern with the languages discussed in the literature for verb stranding ellipsis, providing evidence for the proposal made here. The second piece of machinery I discussed was the fact that some surface forms are derived via different derivational histories. I used matching conditions in inflectional material in ellipsis contexts as a test to determine whether a synthetic verb form was built in a single or two-step derivation. Finally, I discussed consequences for movement with phonological material and predictions for apparent syntax-phonology mismatches.

This approach then makes various predictions that can be tested in other languages, and if it is on the right track this approach has implications for the post-syntactic component(s), and word-building potentially involves multiple operations that map syntactic structures and features to a phonological representation through a series of derivational steps.

4

Words, auxiliaries, and phases

The analysis presented in the previous two chapters has been one where certain types of head movement can be sensitive to phase heads. In this chapter I explore the implications for phase theory, and predictions for how synthetic and periphrastic forms should correlate with other phenomena that are sensitive to phases.

There has been a discussion both in the morphological and the syntactic literature what heads count as phases, and what type of effects phases can have. One line of reasoning argues that phase heads occur inside ‘words’, and as such trigger domain effects for phonological processes (Marantz 2001, 2007, Marvin 2003, 2013, Embick and Marantz 2008, Newell 2008, Embick 2010, Newell and Piggott 2014, Creemers et al. 2018). On the other hand, it has been argued that phases delimit

movement and word building processes (Li 1990, Wojdak 2005, Compton and Pittman 2010).¹ The first group of analysis—phases inside words—mostly look at phonological processes. The latter group of analyses—phases outside words—has focused on both word-building processes and movement or incorporation from one clause into a higher clause, and mainly looked at boundaries at the CP (or DP) level.

The focus in this dissertation is mostly on the first domain in a clause, roughly corresponding to a head in the theta or verbal domain. Crucially, the analysis here has been using the reasoning from the ‘phases outside words’ analyses to account for auxiliary patterns, and syntax-phonology mismatches. The data that I used for this analysis is repeated in (1), exemplified for Turkish.

- (1) a. [yaz -ıyor] [ol -acak]
 write -PROG AUX -FUT
 ‘s/he will be writing’
- b. [[kal -ıyor] =du]
 stay -PROG PST
 ‘was staying’
- c. [kal -dı]
 stay -PST
 ‘s/he stayed’

I argued that for all these cases in (1) there is a phase boundary above aspect, and tense is always part of the second domain. A shortened analysis of each of the forms is given in (4.1). I explain each case below the examples.

	Output Cycle 1	Movement	Surface form
a.	[(/ stay -ing /) _ω] [T+AUX]	n/a	(/ kal -ıyor /) _ω (/ ol -acak /) _ω
b.	[(/ kal -ıyor /) _ω] [T+AUX]	[(/ kal -ıyor /) _ω T+AUX]	((/ kal -ıyor /) _ω =du) _ω
c.	[V] [T]	[[V] T]	(/ kal -dı /) _ω

Table 4.1: Movement and phases

¹Li (1990) argues that X⁰ movement of a functional head is not possible into a lexical verb, in Government and Binding analysis. This can be recast here as a type of movement where head movement cannot cross a CP boundary. There are exceptions to this, such as determiners that can move in Gallican (Gallego 2010), but, as argued in the previous chapter, there are languages that have movement before spell-out which can lead to phase extension, and as such have different properties.

In case of a periphrastic tense, after the first cycle the aspectual phase heads triggers the insertion of phonological material and the result is a phonological word that includes the verb and the aspectual morpheme. T cannot attach to this head anymore and needs a host, which is an auxiliary. Thus, this, I argued is a clear-cut case of phase heads delimiting syntactic and phonological words, (a.). This analysis is the same in case of mismatches, but Turkish has an additional process where a (complex) head can attach to a phonological word at a later point in the derivation, after the verb-word including the aspectual head has been spelled out already, (b.). Thus, even though there is a ‘phase inside a word’, it is a *phonological* word, and phases do delimit *syntactic* words. Finally, I also argued that in simple tenses there is an effect of the phase, and I argued that the synthetic verb form is built in two steps, on two cycles. The output of the first cycle is that the verb-word is not interpreted in the phonology, since the phase head is removed. On the second cycle T can then still attach to the verb, since it is an appropriate host, and can then be spelled out as a single phonological unit, (c.). For each of these cases, there is never a phase boundary *inside* a syntactic word-unit on the first cycle. I argued that in case of languages where the order of movement and spell-out in the syntax is reversed, it might look like there is a phase head inside a syntactic word. However, in these cases the phase is extended and the higher head is the phase.

The previous chapter discussed various pieces of evidence in favor of the timing of head movement, and the derivation of simple tense forms (in English), mainly by looking at matching conditions on verbs and inflectional material in ellipsis constructions. This chapter focuses on the status of the phase boundary in periphrastic and synthetic forms. I follow the line of reasoning that syntactic words, and thus syntactic head movement operations, are delimited by phases (following Li 1990, Wojdak 2005, Compton and Pittman 2010), and that mismatches that seem only phonological should have a syntactic reflex if the phonological mismatch were to be analyzed due to phases. However, the focus here is on the inner verbal phase, and not the CP or DP phase.

I assumed, with Aelbrecht (2010), Harwood (2013, 2015), Aelbrecht and Harwood (2015), Wurmbrand (2017) that Aspect can count as the inner verbal phase. If that is the case, there should be, first of all, evidence of that in other phenomena than auxiliaries. I discuss how this has been

argued for English in Sec. 4.1. Harwood (2014) in fact showed that there is a correlation between various phenomena in English that pick out the progressive, but not the perfect or any higher material. He argued that this correlation can be explained by assuming that the progressive is part of the inner phase. In this section I also come back to the discussion of phases-inside versus phases-outside of words.

If this can be shown for English, these correlations should be visible in Japanese and Turkish as well, since I argued these languages have the same type of movement. I explore to what extent this aspectual boundary is visible in these languages as well in Sec. 4.2 by looking at fronting, ellipsis and various particle constructions. Crucially, since I assume that even in simple synthetic tenses there is a phase boundary, and the verb-form is formed on two cycles, simple tenses should behave parallel to periphrastic constructions.

Even though I show that there are correlations, this is only the beginning of this exploration, and various issues arise which have to do with modeling of how phases and spell-out interact. That is, different phenomena have been accounted for by either assuming that the phase and the Spell-Out domain are the same, or that the phase and the complement of the phase can be separated. I discuss these issues with regard to how to model these correlations in Sec. 4.2.

Finally, I discuss how this phasal approach to word-formation compares to other theories of periphrasis, Sec. 4.3. One major issue that arises with the proposal put forward here is why there are periphrastic passives in English, which is not a problem for the alternative approaches. I discuss that the passive might be a different type of periphrastic construction, with a different underlying syntax. The proposal here argues that one road to periphrasis is head movement being blocked by phases, this does not mean that this is the only way to form periphrastic constructions. This will also be the focus of the next chapter, where I also show that the passive seems to be an exception with regard to periphrasis.

4.1 Phases and word formation

This section focuses on the various assumptions that I made about phases throughout the dissertation. The next section then tests various predictions. First of all, domains have been around in various forms in syntax: for example in Ross (1967), Chomsky (1973, 1986), Huang (1982), Grimshaw (1990), and, most recently as phases (Uriagereka 1999, Chomsky 2000, 2001, 2008). Within the phase literature, there are various views as to what counts as a phase head. In the first section I discuss why viewpoint aspect might be a phase head, and can be part of the first, inner domain. Thus, even though I used the assumption that Aspect can be part of the inner phase to account for the distinction between tense and aspect occurring on the verb, I am putting the proposal here in a wider literature and show that other people have various reasons for assuming this.

A different part of Phase theory has been how phases interact with spell out domains, this will be the focus of Sec. 4.1.2. That is, various proposals assume that it is the complement of the phase head that gets sent to spell-out, whereas others assume that the phase head is included with the spell-out domain. I have been assuming that it is the latter, in case of aspect and verb-formation. And, even though I show there are various correlations between tense and aspect and other phenomena that have been accounted for within phase-theory, there are various issues with assuming one or the other type of Spell-Out theory when putting all the data together. These issues will be discussed in the next section, whereas this section focuses on the various options.

Third, I focus briefly in Sec. 4.1.3 on how a simple and periphrastic tense form is built in this model, and repeat this from previous chapters. I also repeat the patterns discussed for Japanese and Turkish, in order to facilitate the discussion in the next section regarding the correlations. Finally, I briefly touch upon other theories that assumed that phases play a role in word-formation, Sec. 4.1.4.

4.1.1 The role of Aspect

Domains have been around in various forms: for example as bounding nodes, barriers or extended projections, and phases to name a few (Ross 1967, Chomsky 1973, 1986, Huang 1982, Grimshaw

1990, Uriagereka 1999, Chomsky 2000, 2001, 2008). Within the phase literature, there are various views as to what counts as a phase head, and this will be the discussion in this section. The first approach assumes that certain heads always count as a phase (Chomsky 2000). The other view assumes that phases can be flexible, and that it depends on the syntactic context when a domain is closed off (Bobaljik and Wurmbrand 2005, den Dikken 2007, Gallego and Uriagereka 2007c,a, Wurmbrand 2013, 2017, Bošković 2014). Moreover, there seems to be little consensus on what can count as a phase (see D’Alessandro and Scheer 2015 and Van Craenenbroeck et al. 2020 for overviews). These two variables (rigid or flexible and which heads) are important in light of the focus of this dissertation. That is, it is important to define what counts as a phase in the clausal domain with respect and how this interacts with verbs. For the purposes of this dissertation, I use the following definition, (2), taken from Wurmbrand (2017).

- (2) a. The highest projection of a cyclic domain constitutes a phase
b. The cyclic domains of a clause are
 i. The extended thematic domain of V;
 ii. The combined T and C domains

The intuition behind this definition is that the clausal spine can be split up into at least two domains: one consisting of thematic material, and the other consisting of T/C (roughly speaking ‘inflectional’) material. The boundary around CP has been considered less controversial than the boundary around the VP domain. There has been evidence that the thematic domain of V has a boundary around *v*: Chomsky (2000, 2001, 2008), Legate (2014), Travis (2000, 2010), van Urk and Richards (2015), Thoms and Sailor (2018). However, this has been under debate, and it might be that some languages do not have a *v*P boundary such as Korean (Kang 2014), or Hindi (Keine 2017). The proposal here uses a phase as a type of ‘conspiracy’. That is, if there are multiple phenomena in a language that seem to be pick out the same domain, we can analyze this as phasal effects. Of importance is here if it is possible to derive auxiliary patterns where Tense and Aspect are split, via a phasal analysis.

Thus, following the idea that the clausal spine is indeed split up in the way as stated in (2), the next question is: what counts as the inner phase? Generally it is assumed that some form of *v* is the phase head, and that all material above is part of a higher phase, which is also how it is stated in (2). The question in this dissertation is what happens with aspect. The function of aspect is not that easy to pin down, and seems to manifest properties of both the thematic and the functional domain (Krifka 1992, Borer 1994, Kiparsky 1998, Travis 2000, 2010). Aspect can have an effect on argument licensing, but it also contributes to the tense/event interpretation of the sentence, and as such is part of the inflectional domain. As such, it might be part of either phase. In fact, all options have been assumed: all aspectual projections are separate phases (Butler 2004, Henry and Cottell 2007, Deal 2009), are part of the TP/CP phase (Chomsky 2000, 2001, Svenonius 2004, 2005), are part of a single internal phase (Wurmbrand 2012a, 2014, Bošković 2014). It has indeed been proposed that the nature of aspect can vary from language to language (Kang 2014, Todorović 2016, Todorović and Wurmbrand 2017). I assume, following Aelbrecht (2010), Harwood (2013, 2015), Aelbrecht and Harwood (2015), Wurmbrand (2017), that aspect can be part of the inner phase.

But why is it this category can be part of the inner phase? The evidence that is put forward by (Harwood 2013, 2015, Ramchand and Svenonius 2014, Aelbrecht and Harwood 2015) comes from differences between English progressives and perfect auxiliaries. The first set of observations go back to Akmajian and Wasow (1975) and Sag (1976). With an English expression that consists of a modal, a perfect, a progressive, and a passive auxiliary and a main verb, (3), there are several restrictions on which auxiliaries can or cannot elide. Thus, in a sentence as (3), it is never possible to elide *have*, (61a), while *being* must be included in the ellipsis site.

- (3) Scary Spice must have been being hassled by the police, and . . .
- a. *Sporty Spice must ~~have been being~~ hassled by the police, too
 - b. Sporty Spice must have ~~been being~~ hassled by the police, too
 - c. Sporty Spice must have been ~~being~~ hassled by the police, too
 - d. *Sporty Spice must have been being ~~hassled by the police~~, too

If it is the case that only phases can be elided, following (Bošković 2014), and that English allows for VP ellipsis (i.e., ellipsis of extended verbal projections), then, according to (Aelbrecht and Harwood 2015), it must be the case that the Progressive layer is part of this phase. Harwood (2013, 2015) shows additional evidence that the progressive can be part of the first phase. He uses tests that pick out a privileged domain, and that have analyses that say that this domain is in fact a phase (only phases move Chomsky 2008, Fowlie 2013, Roberts 2010b; idioms Svenonius 2005). For example, he shows that data presented for VP-fronting, pseudo-clefts and predicate inversion the progressive is always included, but the perfect is not. Data are given for VP fronting for *being* and non-finite *have*, which yield different results.

(4) If Darth Vader says that Han Solo was being stubborn, then . . .

a. [**being** stubborn] he was

b. *[stubborn] he was **being**

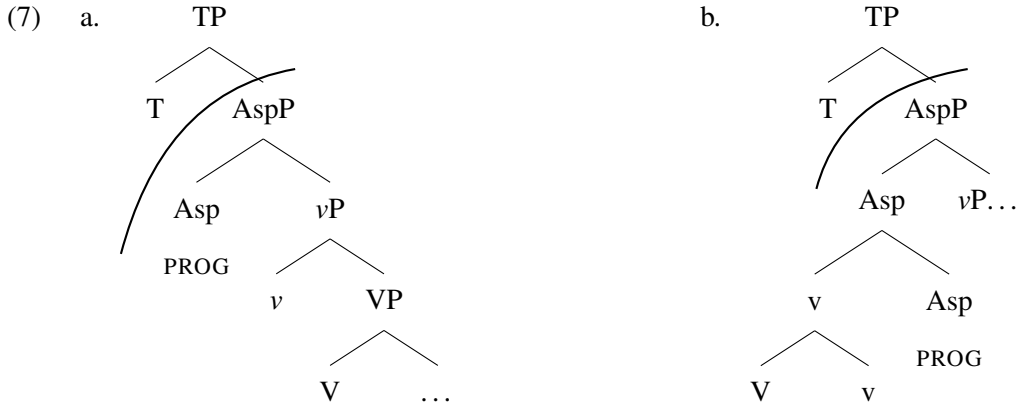
(5) If Luke says he would have fought hard, then . . .

a. [fought hard] he would **have**

b. *[**have** fought hard] he would

Thus, the domain that is picked out for ellipsis, VP fronting and idioms (not shown here) is the same, which can be accounted for by assuming that all of these chunks are targeted because they are a phase. The proposal made here just assumes, following Harwood and others that Aspect can be part of the inner domain. The proposal is extended in that head movement is also sensitive to the same boundary. I propose that the auxiliary patterns that have been discussed so far, where aspect is on the verb, and the tense is on the auxiliary, follow this pattern as well. This is what was discussed in chapter two for Japanese and Turkish, the data with the aspect and tense morphemes are repeated in (6). This is analyzed as follows. When the phase gets sent to spell-out, the spell out domain does not include the tense head when word formation happens. Thus, the complex head that is created only includes aspect, and the remaining heads are stranded.

- (6) a. [hedatar **-te**] [i **-ru**] [Japanese]
 be.distant -ASP AUX -PRS
 ‘It is being (becoming) distant / It is distant ’
- b. [kal **-iyor**] [i **-di**] [Turkish]
 stay -PROG AUX -PST
 ‘was staying ’



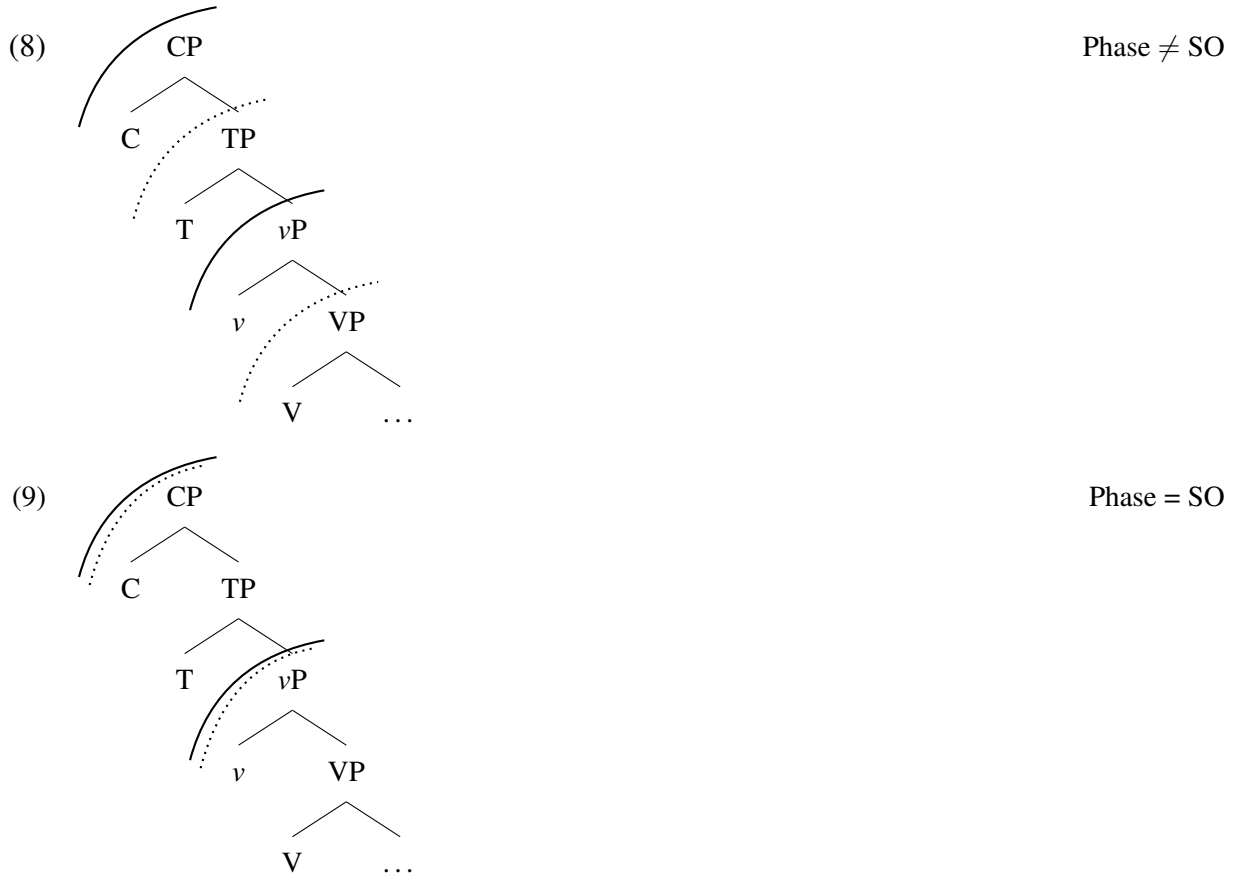
Under this approach periphrastic patterns are easily accounted for.. Moreover, this approach makes various predictions. Namely, that, just as in English, in a language like Japanese or Turkish, we should find similar evidence for domains that are picked out for various syntactic phenomena. This will be the focus of section 4.2. Moreover, as mentioned before, in simple tenses there should be evidence for tense being separate as well, even though this is not visible in the morphology.

4.1.2 What gets sent to Spell Out?

A different question related to phases is what is being sent to spell-out. Under the approach here, I have been assuming that the phase head gets sent to spell-out together with the rest of the phasal domain. However, this is not the only option that has been proposed and here I will focus on why I need to assume this and the variation that exists with regard to this assumption.

There are two different proposals in the literature: those that assume that the complement of the phase gets sent to spell-out (Chomsky 2000, 2001), and those that assume that the whole phase or domain gets sent to spell-out, including the head (Holmberg 1999, 2001, Fox and Pesetsky 2003,

Svenonius 2004, 2005, Bošković 2014, Harwood 2014, Aelbrecht 2016). ²The two options are abstractly exemplified in (8) and (9), where the thick lines indicate the boundary of the phase, and the dotted lines indicate the spell out domains.



Under the assumption that in the examples CP and vP are phase heads, there are in both structures two phases: a CP and vP phase. Abstracting away from when phasal material gets sent to the interfaces, a difference can be made to what part of the phase gets sent: This can be the complement of the phase head, as is shown in (8). In case of the vP phase, it means that the VP gets interpreted first, without v ; and that when the CP phase is built, its complement, TP and v get sent to LF and PF. This is different under the assumption that the whole phase gets sent to spell-out, (9), in this case, once the phase is built the complement (VP or TP) plus the phase heads itself get sent. Thus, under this type of approach v and V are interpreted in the same cycle, and T and C as well.

²I am abstracting away from the timing of the shipping to spell-out: this can either be done as soon as the first phase is built, or when the second phase is built the shipping of material in the first phase happens (PIC1, Chomsky 2000 versus PIC2, Chomsky 2001).

The idea of phases has been put forward to account for the fact that material inside the phase that is shipped off to the interfaces is not visible anymore for higher operations. However, it is not the case that all material is always trapped inside a phase. That is, there is material that can be part of higher phases as well. This is why the first division has been proposed, i.e. a difference between the domain and what gets shipped to the interfaces: to allow for escape hatches. Since neither the phase head, nor the specifier are shipped off to the interfaces, any material that has to be part of the higher domain needs to move through the edge of the phase. Thus, for example, when objects need to move out of the inner phase, they are generally argued to stop at the edge of the first phase .

The ‘whole phase is the spell out domain’ proposal was made with regard to ellipsis (Holmberg 1999, 2001, Fox and Pesetsky 2003, Gengel 2007, 2008, Bošković 2014, Aelbrecht 2016), and with regard to which phrases can move (Svenonius 2004, 2005, Fowlie 2013, Roberts 2010a, Richards 2011). For example, with regard to VP-ellipsis it has been argued that the whole phase, including the phase head get deleted. This makes the prediction that A'-extraction out of the ellipsis site is not possible anymore (Aelbrecht 2010). A similar argument has been made with regard to Japanese argument ellipsis. It has been observed that A'-extraction is not possible out of the ellipsis site of an argument (Shinohara 2006, Saito 2007), (10).

- (10) *Sono hono-o_i Taroo-wa [_{CP} Hanako-ga *t_i* katta to] itta si, sono hon-o_j
 that book-ACC taroo-TOP hanako-NOM bought that said and that book-ACC
 Ziroo-mo Ø itta
 ziroo-also said
 Taroo said that Hanako bought that book, and Ziroo also said that she bought that book'

Returning to periphrasis there are in principle two options, relating to the spell-out domain being the full phase or the complement of the phase head. Up until this point I assumed that when aspect is projected, it is the phase head, and when material gets sent off to spell out, it includes the phase head. As we will see below, especially with regard to fronting phenomena, it might be necessary to assume that there is a different option possible: the phase head does get sent to spell-out, but the specifier remains behind. I discuss various implications for this.

4.1.3 Building a synthetic and a periphrastic verb form

Putting all of the information together from the above sections, I now provide again the derivations for a synthetic and periphrastic construction. The data that is analyzed in this way is repeated for English, (11), Turkish, (12), and Japanese (13) from previous chapters. In all cases the a) examples provide simple tenses, whereas the b) examples show a periphrastic form. They basically show the same pattern.

(11) English

a. [walk -**ed**]

b. [**was**] [walk -**ing**]

(12) Turkish

a. [kal -**dı**]
 stay -PST
 ‘s/he stayed’

b. [kal -**ıyor**] [i -**di**]
 stay -PROG AUX -PST
 ‘was staying’

(13) Japanese

a. [hedatar -**ru**]
 be.distant -PRS
 ‘It is distant’

b. [hedatar -**te**] [i -**ru**]
 be.distant -ASP AUX -PRS
 ‘It is being (becoming) distant’

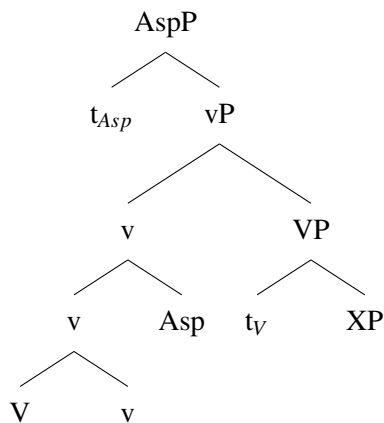
This data are a repetition, but this data will be used in the next sections when looking at the phrasal phenomena. The analysis here is repeated from above, but now also include the output for the English forms. Note that I give the trees for English, but the derivations for each of the examples above are exactly the same as for Japanese and Turkish.³ The only difference in how I represented it is head final versus head initial structures.

For a synthetic verb the structure is as follows. I assume that Aspect still is a phase, but since there are no any features in it, it does not project morphologically. That is, I assume that the whole

³As discussed in the previous chapters, there might be other steps of head movement at a later point in the derivation, such as movement with phonological material in Turkish and Japanese. Since this type of movement is after syntax and does not bear on phases I do not discuss it here. However, the prediction is that the phonological words that are derived with this type of movement should behave identical to periphrastic constructions.

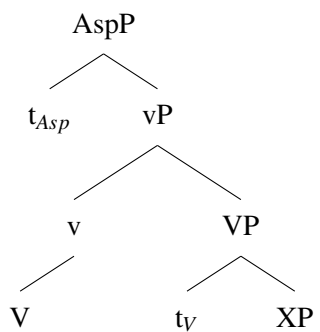
phase gets sent to spell-out, including the aspectual head, (14). Head movement is timed after spell-out (see Ch. 2 and Ch 3.). After this morphological operations can take place, in this case removal of unmarked heads. This means all heads except for the main verb is removed, (15). Then, since there is no phase head present, nothing else will happen to this complex head and it remains in the syntax available for the second cycle. After this, in the second domain, Tense can move onto the verb. After this the verb is phonologically interpreted.

(14) Synthetic verb



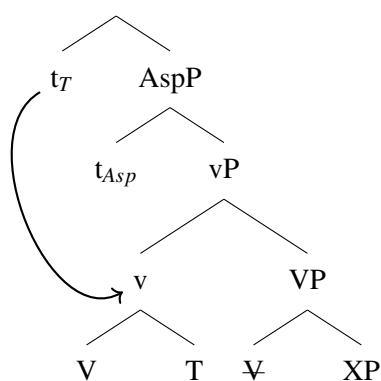
[head movement]

(15)



[Removal]

(16) [Second Cycle Movement]

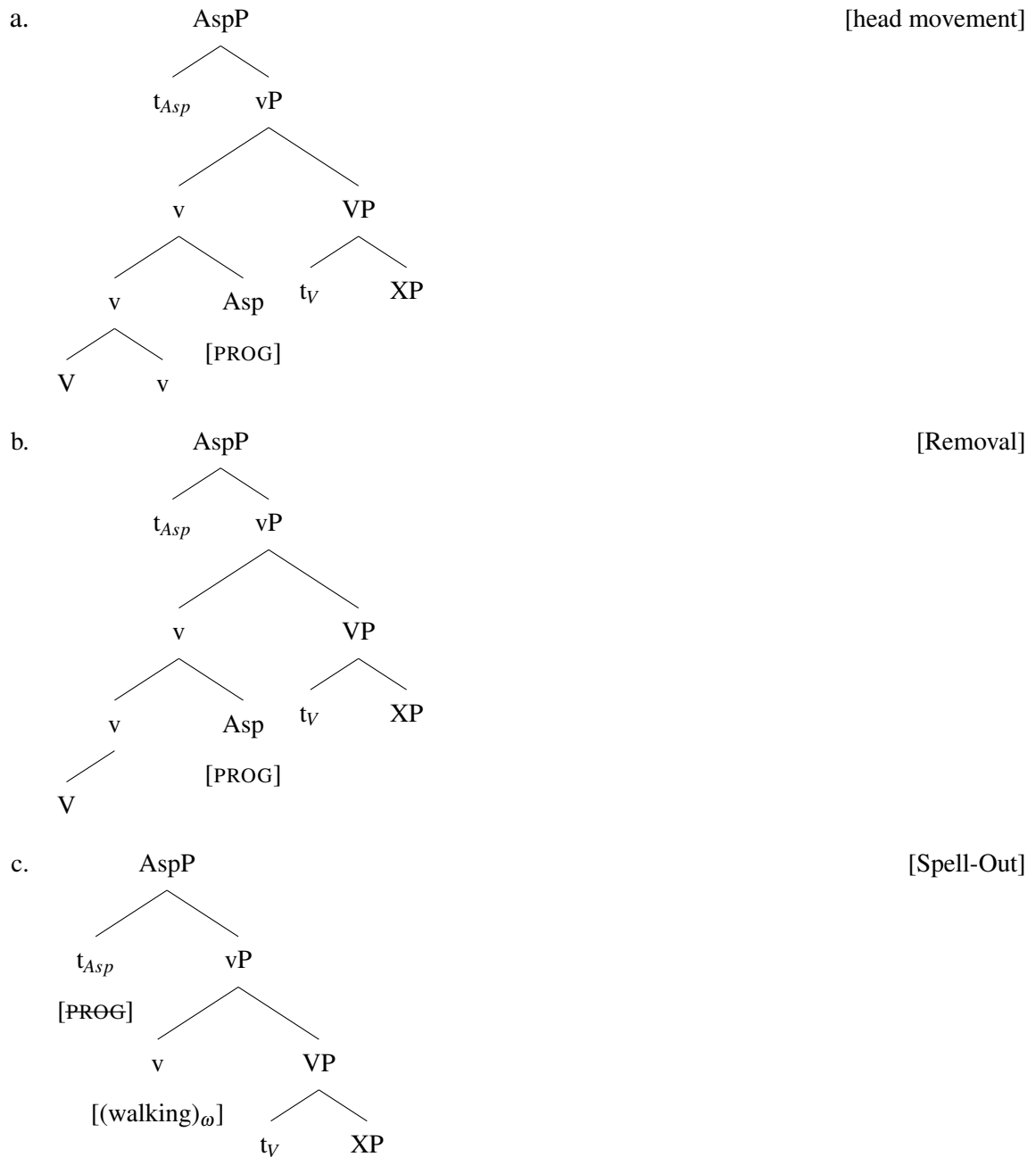
(17) (walked)_ω

Note that I represented the derivation on the second cycle with movement going down. As discussed in the previous chapter this is done based on the observation that adverbs generally occur in a higher position (Pollock 1989). However, since movement occurs after phasal material is sent to spell-out, direction is not necessarily down or upwards. Moreover, there is also a line of reasoning that argues that in English there is in fact movement to T (Ochi 1999). The pattern is the same for Japanese and Turkish for simple tenses. Since these are head-final languages it is even more difficult to determine where the verb+T complex ends up. Crucially, all three languages have a two step derivation for simple tenses, because there is an effect of the phase boundary. This means that all languages should behave the same with regard to phasal phenomena. This will be shown in the next section when I focus on the correlations between phases and word-building.

A periphrastic construction is derived as follows. The first two steps are the same as for a synthetic verb form. However, when removal takes place, the phase head is not removed, since it carries a feature, PROG. The fact that the phase head remains, means that the complex can be interpreted in the phonology, i.e. a phonological unit is created. This output will then be put back into the syntax. At this point for the verb there is no hierarchical structure present anymore, nor are any categories but the highest head. Then, in the second domain, the tense head cannot lower onto the verb. This is because it requires a verbal root host, but since the main verb root is interpreted in the phonology, the main verb does not carry that information anymore. As a rescue an auxiliary is inserted, and this is spelled out as well. This means that in a periphrastic construction there are two

phonological words.

(18) Periphrastic construction



- d. [✗ Movement]
-
- e. [✓ AUX insertion]
-
- f. (is)_ω (walking)_ω

To summarize, this means that in both periphrastic and synthetic verb forms the phase plays a role, and in both derivations T remains outside of the verb-word on the first cycle. However, in case of synthetic forms T can still move onto the verb because the phase head is unmarked and is removed. Since spell-out occurs per domain, it means that there should still be evidence of T being separate in the syntax, even though it forms a single morphological and phonological domain with the verb in synthetic tenses. This will be tested in the next section. Before moving there I briefly discuss the relation between phases and words in previous literature.

4.1.4 Phases and words

In much recent literature that assumes a syntactic, realizational approach to word formation, the question has been asked what the equivalent is to a phase in a word. Many have taken the answer to

be categorizing heads, such as *n*, *a* and *v* (Marantz 2001, 2007, Marvin 2003, 2013, Embick and Marantz 2008, Newell 2008, Embick 2010, Lowenstamm 2015, Creemers et al. 2018). Most of these accounts provide analyses for (morpho)phonological phenomena, such as stress-assignment, allomorphy and (root-)suppletion. These type of phenomena often have been accounted for in cyclic models or level-ordering in the morphology. Since the research program in these frameworks has been to show that morphology is in fact syntactic, there has been a move to saying that categorizing heads are cyclic/phasal heads. On the other hand, it has been argued that phases delimit movement and word building processes (Li 1990, Wojdak 2005, Compton and Pittman 2010), which is also the line of reasoning taken in this dissertation.

The direction taken here is thus different from the first group of proposals: the assumption here is that phases do play a role, but they are not inside the syntactic word, but actually limit the word-building process. In cases where movement crosses the phase (as I have argued is the case when the timing of head movement and spell-out is reversed), it might be the case that the phase head is extended. One of the advantages of assuming that the relation between phases and word-building is one of blocking allows us to test both phonological and syntactic aspects of it. Doing that has been proven difficult when one assumes that the categorizing heads are similar to syntactic phases, because it has been hard to find syntactic counterparts. Moreover, the effects of these heads within words are generally very local, i.e., it is generally the adjacent head, or maybe one head higher. Thus, in order to reconcile the findings of those works with the work presented here would be to see if the phases inside words can be remodeled as adjacency effects.

The proposal then in this dissertation is still in line with realizational approaches to morphology (Anderson 1992, Halle and Marantz 1993, 1994, Beard 1995). However, some of the realizational approaches assume that morphology equals syntax all the way down and that there are no constituents that can be called words in the sense that the 'word' is not a meaningful unit of linguistic analysis (Julien 2002, Myler 2014, 2016). These ideas stem from the fact that what phonology cares about as constituents is not necessarily what syntax cares about (Selkirk 1984, 1995, Nespor and Vogel 1986, Sadock 1991). An example is given for Cochabamba Quechua (Meyers 1990, Myler 2014). In (19a)

there is a constituent for phonology in terms of stress assignment, that consists of *boy* and the affix *with*; it cannot be treated as a clitic, because for all phonological tests it behaves as a single unit. However, for interpretive reasons the DP *that little boy* behaves as a constituent to the exclusion of the preposition, just as in English. Myler argues that it can be shown that *boy* is in fact separate, because you can replace *boy* with a pronoun, as in (19b).

- (19) a. Chay huch'uy [wayna -wan] [Cochabamba Quechua]
 that little boy -with
 'with that little boy'
- b. [pay -wan]
 s/he -with
 'with her/him' (Myler 2014, p47.)

Basically, the data in (19) point to a bracketing paradox. The fact that for all phonological purposes *wayna-wan* is treated as a single word, but in the syntax it must be two words, is for Myler (2014) a reason to say that there is no syntactic word. The proposal made in this dissertation is that there is in fact a constituent that we can call a word in the syntax. That is, there are indeed mismatches as in (19). However, the fact that there are mismatches does not mean that there are no syntactic words. The dissertation shows that there are instances where the phonological and the syntactic constituents align, as has been similarly argued for in (Embick 2010, Thornton 2017, 2020). Of course, it is possible to say that it is an accident that among all the variety sometimes phonology and syntax align, and that sometimes groups of morphemes are just perceived as words only at the phonological level (Julien 2002), but this misses the generalizations discussed in this dissertation that for example in Turkish and Japanese the smaller phonological constituents correlate with syntactic constituents. Even though the mapping from syntax to phonology is not always perfect, systematic misalignments are expected in the approach taken here. Thus, the approach taken here is in line with approaches that argues that there are in fact meaningful units that can be called words (Di Sciullo and Williams 1987, Baker 1988, Halle and Marantz 1993, Svenonius 2018, Thornton 2020).

Thus, assuming that there are syntactic words is in line with approaches that generally are

considered to have the word-building operation in a different component of grammar preceding syntax (Di Sciullo and Williams 1987). I assume that words are built in the syntax, but that there is a type of ‘bottleneck’ effect (Williams 2007). One of the reasons why word-building seems to be sensitive to the syntax is in fact the existence of the overflow pattern discussed in the previous section: in order to know if a single or two words are needed, one needs to know that both of the morphemes need to be expressed in the utterance.⁴ Thus, part of the dissertation is also to show evidence that the synthetic-periphrastic alternations is not a random alternation, and that it actually means there are one or multiple words in the syntax. The evidence consists of phonological and syntactic tests that align for the same constituent, as discussed in Chapter 2. This means that there might be phonological units, as discussed for Japanese and Turkish in Chapter 2, that are bigger than syntactic words, but that there is a constituent that corresponds to a word in the syntax and the phonology. Moreover, as we have seen for English above, even though the formation of periphrasis is sensitive to the syntax, it does not mean that all synthetic forms are also units in the syntax.

4.2 Correlations between auxiliaries and phrasal constituents

This section explores the relation between auxiliary patterns and phrasal constituents. That is, as mentioned in the introduction, the dissertation follows approaches to word-building that assume that phases delimit syntactic units (Li 1990, Wojdak 2005, Compton and Pittman 2010). As set out in the previous section, the focus in this dissertation is on the inner verbal phase, which I assume can be located around aspect. Moreover, as discussed in relation to Harwood (2014)’s work, it is possible to test the aspectual boundary by looking at various phrasal phenomena that have been argued to be phase-bound. Thus, the prediction is that for Japanese and Turkish, the two languages discussed in detail with regard to auxiliary patterns, should pattern the same as English. First of all, the prediction is that since aspect is a phase, there should be a split after aspect. This will be shown for fronting and ellipsis phenomena in Japanese and English, and in Turkish I discuss, following

⁴Of course, there are other pieces of evidence that point in the direction that morphology is not built before the syntax. This dissertation is in line with mirror-principle observations (Baker 1985, 1988).

Kamali (2011b) that focus particles provide evidence for aspect as a phase. Second of all, I contrast these aspectual data with simple tenses, since the same prediction is made as for periphrastic cases: tense always remains outside of the first phase even though it can merge onto the verb at a later point in the derivation. As this is an exploration of these correlations, there are certain problems, relating to the timing of when phases are sent to spell-out.

The first section focuses on verb fronting phenomena, 4.2.1. I show that Japanese patterns with English. Moreover, in order to account for the fact that the subject can move to a position outside of the phase, and not be fronted with the predicate, I need to hypothesize that what is fronted is the phase head and its complement, but it leaves the specifier behind, in order to be an escape hatch for the subject. Second, in Sec. 4.2.2 I focus on various particle phenomena in both Turkish and Japanese. For Turkish Kamali (2011b) has put forward evidence that focus particles can be analyzed as a case of a second position clitic in the vP phase, leaving the tense head outside of the domain. In addition, I show for Japanese, that there are various restrictions as to which elements in verbs can be elided in focused constituents. It shows that there is a split between viewpoint aspect on the one hand, simple tenses and causatives on the other hand. However, *hajime* morphemes pattern with the progressive marker. I argue that this behaviour is due to these morphemes being a root rather than a bound morpheme (see also Ch 2). Finally, I briefly discuss VP-ellipsis data in Sec. 4.2.3. Harwood (2014) has shown that the pattern with auxiliaries makes a split between the progressive and higher auxiliaries in that the progressive can be elided but other material cannot. Japanese does not have the same VP ellipsis data, but VP ellipsis including do-support tentatively show that there is a split in which adverbs can be licensed inside the ellipsis site, and which readings (progressive or not) are available. That is, VP adverbs can, but TP adverbs can never be licensed.

4.2.1 Verb Fronting

As mentioned in the previous chapter, Harwood (2014, 2015) shows that there is a correlation between various syntactic phenomena that pick out the progressive layer in English. In this section I will spell out what the predictions are and offer preliminary discussion for Japanese. As will become

clear, there is a split between aspect and tense, but the pattern with regard to other suffixes, such as the causative is more complex.

The first phenomenon to be discussed is VP-fronting, where it is possible to include the progressive in the fronted VP, (20), but not higher auxiliaries, such as the Perfect (21).⁵

(20) If Darth Vader says that Han Solo was being stubborn, then . . .

a. [**being** stubborn] he was

b. *[stubborn] he was **being**

(21) If Luke says he would have fought hard, then . . .

a. [fought hard] he would **have**

b. *[**have** fought hard] he would

This pattern can be explained, Harwood (2014, 2015) argues, when it is assumed that only phases can be moved and the progressive is included in the phase. If this is put together with the proposal made here, it should be possible to see similar effects in the languages discussed in this chapter, if the language allows for a similar process of VP or predicate fronting.

Interestingly, when there is a combination of tense and aspect in Japanese, the aspect marker can remain on the verb, and can be fronted, (22a). Crucially, it is not possible for the tense marker to be fronted, (22b).⁶

(22) a. ?_[ASPP] aogaeru-o **tabe-te**-sae/mo/wa/dake] Kaonashi-ga *t*_{ASPP} i-ta [Asp]
 Aogaeru-ACC eat-ASP-even/also/TOP/only No.Face-NOM AUX-PST
 ‘No Face was even/also/only eating Aogaeru’

b. *_[TP] aogaeru-o **tabe-ta**-sae/mo/wa/dake] Kaonashi-ga *t*_{TP} [Tense]
 Aogaeru-ACC eat-PST-even/also/TOP/only No.Face-NOM
 ‘No Face even/also/only ate Aogaeru’

This asymmetry between tense and aspect is important in light of what is being claimed here and is in fact very similar to the data presented for English: constituents including aspect can be

⁵This section only focuses the correlation between aspect and verb fronting. For variation and overview in predicate fronting patterns see Hein (2017, 2018).

⁶It is also grammatical to strand the aspect marker with do-support. However, what is important is that there is an asymmetry between tense and aspect and that the largest constituent that can be fronted includes aspect, and not tense.

moved around. If it is the case that only phases can be moved, it means that the phase can include aspect, but not tense. This is then parallel to where the auxiliary boundary is in Japanese, namely between tense and aspect.

Turning to simple tenses, it is expected that, even though it is possible to morphologically pronounce the tense morpheme on the verb, there should be evidence that they are separate in the syntax. As shown by Bobaljik (1995), this is the case in English. That is, it is not possible to include the tense marker in the fronted constituent. In order to make it grammatical, there is do-support to host the tense marker.

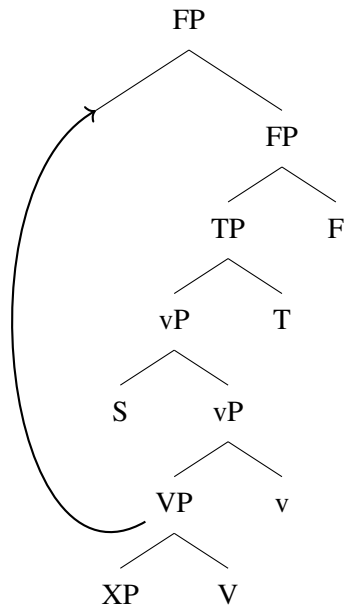
- (23) a. Someone told Ziggy to play the guitar, and [play the guitar] he did
 b. *Someone told Ziggy to play the guitar, and [play-ed the guitar] he

Japanese, behaves parallel to English in this respect. This was also discussed in Ch. 3, Sec. 3.2.3.1. The data are repeated here as (25). It is not possible to front tense, but in order to pronounce T, this head needs to be supported by the auxiliary ‘do’.

- (24) * $[_{TP}$ aogaeru-o **tabe-ta**-sae/mo/wa/dake] Kaonashi-ga t_{TP} [Tense]
 Aogaeru-ACC eat-PST-even/also/TOP/only No.Face-NOM
 ‘No Face even/also/only ate Aogaeru’
- (25) $[_{ASPP}$ aogaeru-o **tabe**-sae/mo/wa/dake] Kaonashi-ga t_{ASPP} si-ta [particle]
 Aogaeru-ACC eat-even/also/TOP/only No.Face-NOM do-PST
 ‘No Face even/also/only ate Aogaeru’ based on (Funakoshi 2020)

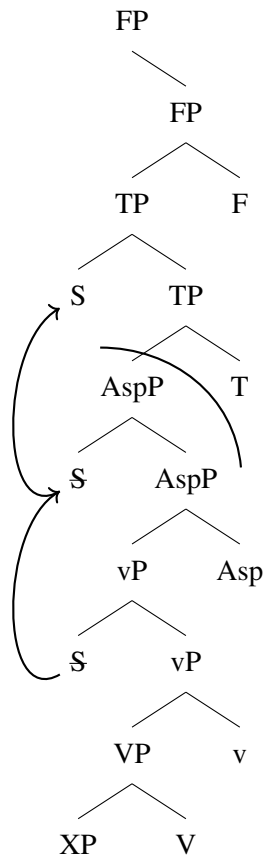
What does this mean in terms of an analysis and which part of the phase is sent to Spell-Out? There are two possibilities. In any analysis the subject does not move to a fronted position, which might be problematic. Under an analysis where aspect has not been taken into account, this can be analyzed as a type of VP fronting, where the subject, in SpecvP does not have to move, (26).

(26)



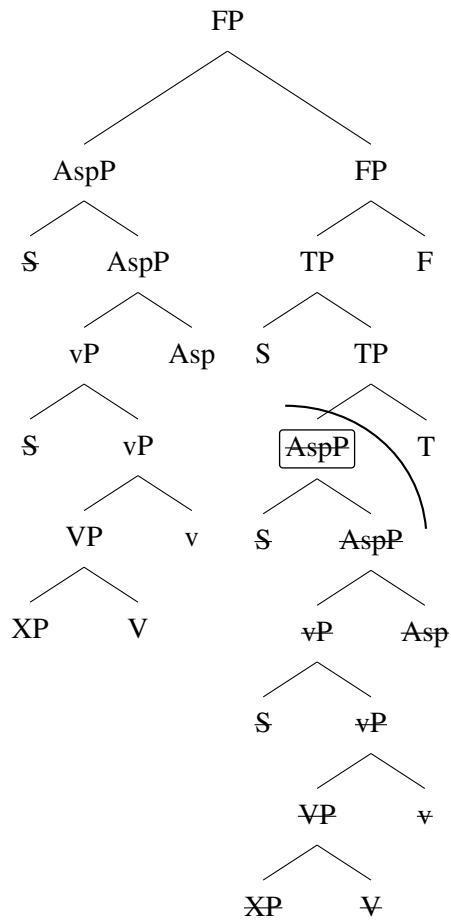
However, in both English and Japanese it is possible to move the aspectual morpheme (affix or auxiliary) as well. If that is the case, the subject would be trapped inside this chunk, since the aspectual head is presumably above the base position for the subject. Thus, this must mean that the subject must move to a higher position, either the specifier of ASP, or specTP, (27).

(27) Subject movement

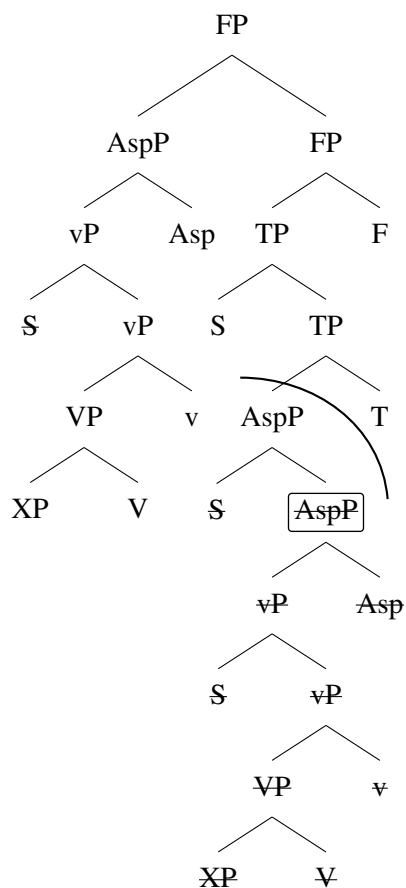


This raises the question what the nature is of the moved constituent. It could either be the whole AspP, (28), or the head, but not the specifier, (29). In both cases all verbal heads up until Asp are moved, and the object is moved as well.

(28) Fronting whole AspP



(29) Fronting AspP without Spec



I assume that in whatever analysis is chosen, head movement in those languages only takes place after material is sent to Spell-Out. The verb will remain stranded, and an auxiliary is inserted to host the tense head. I assume, repeated from Ch 3, sec. 3.2.4.1 that *do* is inserted as default, but */i/* is inserted in case the sister of T carries the feature [+prog]. Thus, in both periphrastic and simple tenses, I assume that the whole phase moves. This means that in simple tenses, even though generally morphologically expressed on the verb, can show an effect of being separate in both Japanese and English. I assume that spell-out in case of the progressive takes place immediately, since the phase head is not pruned. In case of simple tense, following the logic of my proposal, the complex head will not be spelled out. I assume that, when nothing happens in the higher head, it will still be spelled out in the next domain.

With this in mind, the question is what happens with fronting material that is below tense, and

even below the aspect marker, such as *hajime* or the causative marker. So far, it seems that for both *hajime* and the causative it is possible to front the verb with these markers, only if the tense marker is hosted by *do*, (30a, 31a). Without *do*-support the material is ungrammatical, as was also discussed in Chapter 2.

- (30) a. ?[Aogaeru-o tabe-hajime-sae] Kaonashi-ga *t* su-ru
 A.-ACC eat-begin-even K.-NOM do-PRS
 ‘Even No face eats Aogaeru’
- b. *[Aogaeru-o tabe-hajime-sae] Kaonashi-ga *t* ru
 A.-ACC eat-begin-even K.-NOM PRS
- (31) a. ?[Aogaeru-ni tabe-sase-sae] Kaonashi-ga *t* su-ru
 A.-DAT eat-CAUS-even K.-NOM do-PRS
 ‘No face makes even Aogaeru eat’
- b. *[Aogaeru-ni tabe-sase-sae] Kaonashi-ga *t* ru
 A.-DAT eat-CAUS-even K.-NOM PRS

These data are expected if it is indeed the aspect layer that is fronted. Just as with simple tenses, there is in this case a mismatch between syntax and morphology: in the morphology the aspectual head is removed, and tense can lower onto the verb in non-fronted cases. However, when material is fronted, tense remains stranded. This means that this involves the same analysis as for simple tenses. Once the AspP is fronted, head movement takes place and the main verb is spelled out.

Finally, there is also a pattern which is more complicated to explain. The pattern is as follows. Only the main verb is fronted, and other material stays behind as an auxiliary. In case of the progressive marker, it is possible to pronounce it as an auxiliary, (32). This is not possible for *hajime*, (33), and for the causative marker the judgements differ, (34).

- (32) ?[Aogaeru-o tabe-sae] Kaonashi-ga *t* si-te i-ru
 A.-ACC eat-even K.-NOM do-PROG AUX-PRS
 ‘No Face is even eating Aogaeru’
- (33) *[Aogaeru-o tabe-sae] Kaonashi-ga *t* hajime-ru
 A.-ACC eat-even K.-NOM begin-PRS
- (34) */?[Aogaeru-ni tabe-sae] Kaonashi-ga *t* si-sase-ru
 A.-DAT eat-even K.-NOM do-CAUS-PRS

For these cases the pattern is not that easy to explain. First of all, using the reasoning from Sec. 4.1.2 that there is a difference in the literature whether the whole phase, including the phase head gets spelled out, or if it is only the complement, It could be that (32) involves fronting of the complement of the phase. However, if that is the case, it would violate the anti-locality condition in Abels (2003) that complements cannot be fronted. Returning to the other two cases, *hajime* and the causative in (33-34) I note the following. If both are judged as ungrammatical, it means that the difference comes from PROG being a phase head, whereas the others are not. That is, only PROG has this flexibility of being fronted or not, because there can be flexibility in whether the whole phase, including PROG can be fronted, or the complement of PROG. The other markers are heads that are not phasal, and as such they do not have this flexibility. However, the causative marker is in this case a problem, since there are speakers that allow for the causative to be stranded. I do not have a solution for this at this point, and this remains a problem.

To summarize, both English and Japanese have Predicate fronting. In simple tenses the tense head is stranded. Under the assumption that only phases can move, this is expected in the approach put forward here as well. Even though the phase head is not visible in the morphology, it does show an effect in the syntax. Interestingly, both show similar effects for the progressive: this head can be fronted together with the verb and the object. This means that in this case the whole phase is supposed to be fronted. I also discussed more problematic cases where the progressive can be stranded, which have to be explored more in detail. Finally, it is expected that material below the phase head can be fronted as well. This is in English the case for the passive, and I have shown that this is also the case for *hajime* and the causative in Japanese.

4.2.2 Particles

This section focuses on the presence of certain particles in Turkish and Japanese. For Turkish, these particles have been discussed in relation to word-hood in Chapter 2, Sec. 2.1.2.2. These particles, as repeated for the question particle in (35) can show up at the edge of a ‘word’, or in this case, at the edge of the main verb, before the auxiliary.

- (35) [yakal -i'yor] =**mu** -y -du
 catch -PROG =Q -AUX PST
 'Was s/he catching it?'

Japanese has a contrastive focus particle, *wa*, that can be used in various contexts, but the focus here is on particle stranding ellipsis context in the VP domain. Again, the occurrence of this particle seems to be mostly at the edge of a verb, but it can show up seemingly in the middle, when the tense is hosted by the auxiliary *do*, (36).

- (36) Warawa-se-**wa** si-ta
 laugh-CAUS-TOP do-PST
 '(He) did make (her) laugh, but he did not make (her) cry.'

For Turkish, it has been argued that the placement of these particles is restricted by phases, (Kamali 2011b) and I argue that the pattern in Japanese can be explained by phases as well. First, I discuss Turkish, and the analysis proposed by Kamali (2011b). After this I discuss the particle in Japanese, and the phenomenon that is important for the discussion at hand.

4.2.2.1 Turkish

So far, the discussion in this dissertation of the question particle only focused on the placement in between verb auxiliary patterns. It was shown that the particle attaches to the morpheme that is stressed, which was used to show that there is a word-boundary between the main verb and the auxiliary. However, this is not the only placement, and not necessarily the default placement for this particle. Placement of the particle is usually after the object, (37).

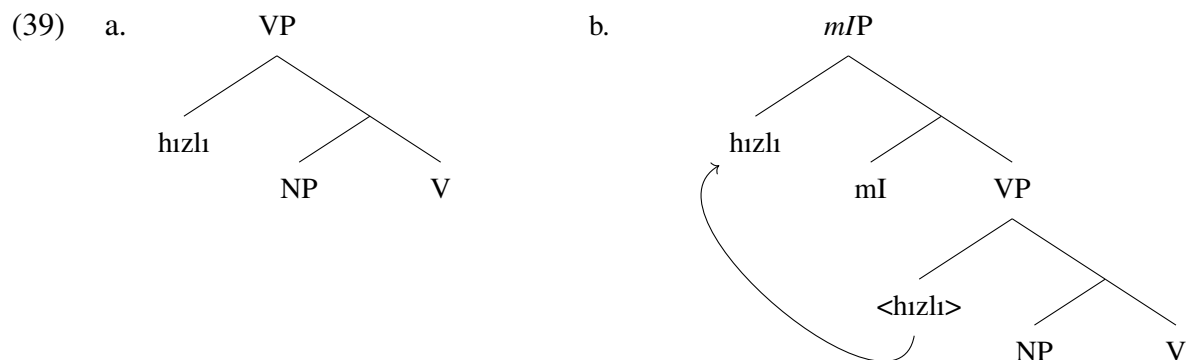
- (37) Ali dün yem'ek **mi** yap-tı?
 Ali yesterday dinner Q make-PST
 'Did Ali cook dinner yesterday?' (Kamali 2011b, 147)

Where the particle is placed, Kamali argues, is dependent on which of these elements carries stress in a declarative sentence. For example, low underived adverbs carry stress, (38a). A derived adverb is outside of the stress domain, and the Q-particle follows the object, (38b). The adverb can

host stress, if it is narrowly focused. The same patterns are found for subjects of unaccusatives and negated verbs.

- (38) a. Ali hız'lı **mi** yemek yap-ar [Underived Adv]
 Ali fast Q dinner cook-HAB
 'Does Ali cook dinner fast'
- b. Ali hızlı-ca yem'ek **mi** yap-ıyor? [Derived Adv]
 Ali fast-ADV dinner Q cook-PROG
 'Is Ali hurriedly cooking dinner?' (Kamali 2011b, 148/9)

Crucially, according to Kamali, the Q-particle attaches by default to the element that carries sentential stress and she argues that this element is usually at the edge of the first phase. Therefore, she argues, the Q-particle is a type of second position clitic for the first phase. She derives the pattern as follows. The highest element (either the low adverb, or the object) in a stress domain, which coincides with the first phase, can move into the specifier of of the Q-particle phrase, which is attached to the edge of the phase, (39).⁷

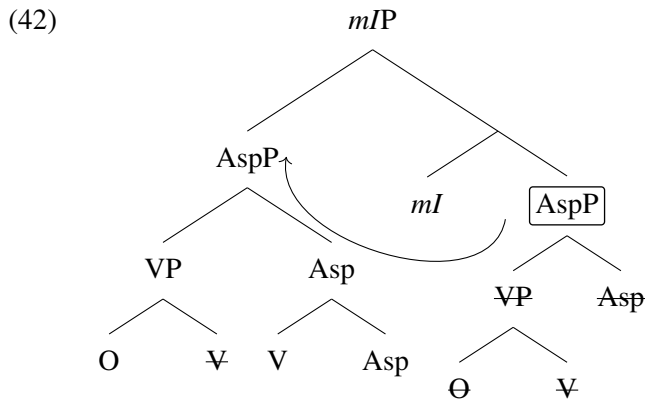
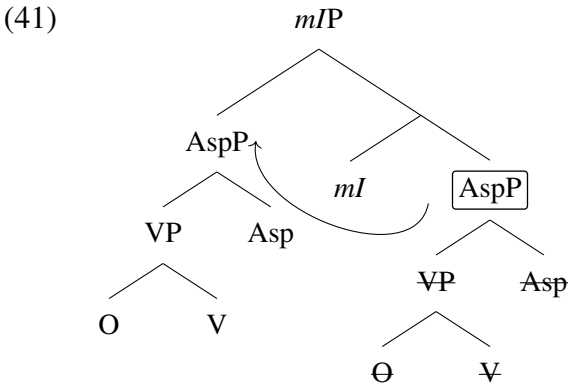


With this in mind, we can return back to the placement of the particle with regard to the verb patterns. In case of aspect-tense combinations, the particle can attach to the aspect marker, but not inside of it. The example in (40) is repeated from (35).

⁷Şener (2010) argues that there is a difference with different types of focus and if movement is possible in Turkish. Specifically, contrastive foci are never in-situ, but other types of focus are. I could not determine at this point what type of focus these question particles are. If they align with those that do not have movement according to Şener (2010), the question is if either his analysis in fact only movement to *mI*, or the analysis here needs to be changed.

- (40) [yakal -i'yor] =**mu** -y -du
 catch -PROG =Q -AUX PST
 'Was s/he catching it?'

There are two possible options to account for this pattern. As before, the Q-particle attaches to the phasal edge. The two possible analysis come from what moves to the specifier to this the Q-phrase: either the whole phase moves, similar to predicate fronting discussed in the section above, or only the verb moves. For the second option, however, an additional step of moving the object is necessary to get the correct order of Object and Verb (not shown in the example, but the object precedes the verb). The first option is represented in (41), where the whole AspP phrase moves into the specifier of the second position clitic. After this head movement takes place, which means the VP only contains the object, (42). Since T is not part of this phase, the particle shows up at the edge of the aspect morpheme, and not tense.⁸

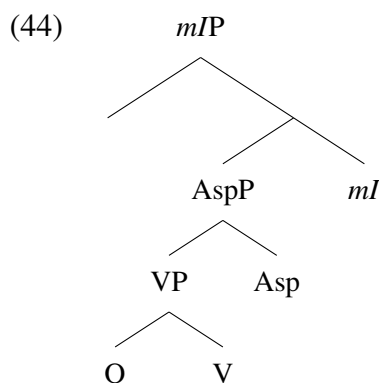


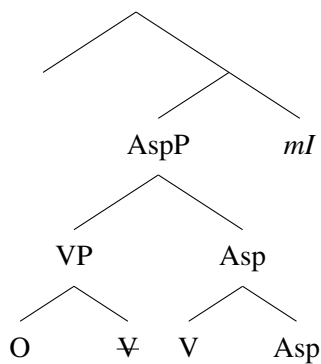
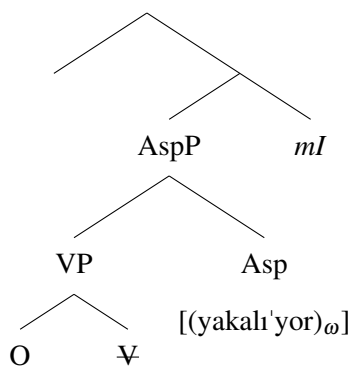
⁸however, this would also require an investigation of when movement is and is not possible, using Şener (2010)'s tests. It might be possible to unify the data from Kamali (2011b) and Şener (2010) by assuming that only a small step of movement is possible.

This might be a possible analysis, but this implies that there is some type of VP fronting in Turkish, which looks like Japanese VP fronting discussed in the previous section. More work on Turkish VP fronting is needed, but the literature points to the option that when it is possible it is not the case that the whole verb with all the morphology is spelled out. Rather, the verb is in infinitive form, and it is doubled and also present in the base position, (43). The example might need different glosses, specifically for *mesine*, since this could be a contrastive topic marker. However, the important thing is that *miş* is not present in the doubled form.

- (43) **git-miş git-me-sin-e**, ama doktor gel-me-miş
 go-EVID go-INF-CM-DAT but doctor come-NEG-EVID
 ‘I gather he did go, but the doctor didn’t come’ (based on Göksel and Kerslake 2005, 410)

If this is the case, it means that VP fronting to a clause initial position is different from moving to a clause medial position. In that case the analysis in (41-42) would be on the right track. These issues have to be investigated more carefully. A different option to account for the cases with *mI* where the particle is head final, rather than head initial. In this case the derivation is as follows, in fact very similar to the mismatches between vowel harmony and stressed discussed in Ch 2. First the verb-asp complex needs to be sent to spell-out, and be interpreted. Since Asp is a phase head, the complex head will be interpreted in the phonology. This phonological element is then returned to the syntax again. At this point Movement can take place of *mI* onto the verb.



(45) [head movement](46) [phonological interpretation](47) $[(yakalı'yor)_{\omega}]_{asp} [mI]_{mI} \rightarrow [(yakalı'yor)_{\omega} mI]_{mI}$ [Movement](48) $((yakalı'yor)_{\omega} mu)_{\omega}$ [Phonological Interpretation]

Under this analysis there is no syntactic movement of the stressed element at all, there is only movement of the verb at PF. However, this then means that the data that Kamali (2011) analyzed with the object moving, in order for *mI* to be adjacent to the object or the adverb require different types of movement. That is: even though the focused element does not move, all the other material does need to move. When the object is stressed, only the verb needs to move, but when the adverb is stressed, the object and the verb both need to move.

To summarize, I presented two options to analyze the data with *mI*, keeping the insights from Kamali (2011b) that this particle is attached to the inner phase. Both of the analyses have their problems and require more work. If it is the case that the particle is not head final, the whole phrase needs to move into the specifier position, but this raises questions about what forms of VP fronting looks like in Turkish. If the particle is head final no special analysis is needed when it attaches to the verb. However, additional steps of movement are needed in case the particle attaches to the

object or an adverb. In either proposal PROG acts as a phase head which allows *mi* to attach to the verb stem since the verb stem is already spelled out.

4.2.2.2 Japanese

Turning to Japanese, the focus will be on the contrastive topic marker in the context of particle stranding ellipsis in the VP domain. This topic marker, *wa*, and its status has been discussed in various places in the literature (see for example Kitagawa 1982, Kuno 1973, Watanabe 1989, Kuroda 1992), but the focus here is on particle stranding constructions (see Takahashi 2011 for particle stranding in the nominal domain). I show that there is a distinction in ellipsis contexts between tense and lower morphology, which points to tense being outside of the verbal domain. The aim here is to focus on the distinction between aspect and tense, and only a preliminary analysis will be provided.

The basic case that is of interest here looks as follows, (49). As an answer to a question, it is possible to answer with only a contrastive topic marker, and elide the main verb, as in (49a). In this case the stranded particle needs to be stressed, and can still be followed by the past tense hosted by ‘do’. It is not possible to elide the verb, but leave the causative marker, (49b). The non-elliptical context is also completely fine, where it is possible to pronounce the whole verb, with the topic marker after the main verb, and having the past supported by ‘do’, (49c). I have left out the follow up sentence from the all answers but the first one for clarity; the intended translation is only given below the last sentence because all have the same meaning.

(49) Context: Totoro was trying to elicit different emotional actions from Mei

Totoro-wa Mei-o warawa-se-ta no?
 Totoro-TOP Mei-ACC laugh-CAUS-PST Q
 ‘Did Totoro make Mei laugh?’

- a. ~~Warawa-se-wa~~ si-ta (kedo, Nakase-wa-si-nakat-ta)
 laugh-CAUS-TOP do-PST but cry-TOP-CAUS-NEG-PST
- b. *~~warawa-se-wa~~ si-ta
 laugh-CAUS-TOP do-PST

- c. Warawa-se-**wa** si-ta
 laugh-CAUS-TOP do-PST
 ‘(He) DID make (her) laugh, but he did not make (her) cry.’

Thus, at this point it seems like it is not possible to strand certain suffixes, such as the causative marker, but the tense head can be stranded, if it is hosted by an auxiliary. What is of interest is whether these morphemes can be stranded without *do* as well, and whether the verb can be elided with or without other morphemes. Thus, in this case, it is possible to elide the verb when it has a suffix attached to it, such as the causative marker. This pattern is different when looking at tense and aspect, (50-51). First only a tense marker is discussed. In this case, it is not possible to strand the tense marker, (50a), nor have the tense hosted by ‘do’, (50b), both preceding and following *wa*. The only possibility is to have the full verb from, with the tense marker supported by the auxiliary, (50c).

- (50) Satsuki-wa sakana-o tabe-ru no?
 Satsuki-TOP fish-ACC eat-PRS Q
 ‘Does Satsuki eat fish?’
- a. *~~tabe~~-{**wa**}-**ru** {**wa**} yo
 eat-TOP-PRS PRT
- b. *~~tabe~~-**wa** su-**ru** {**wa**} yo
 eat-TOP do-PRS PRT
- c. ~~tabe~~-**wa** su-**ru** yo
 eat-TOP do-PRS PRT
 ‘She EATS fish’ (can be followed up by ‘but not COOK fish’)

Thus, if tense is the sole suffix on the verb, and forms a word with the main verb (as shown in Sec. 3.1), it cannot be left without the verb stem, nor can an auxiliary host it. This is in some way surprising, since this was possible in the example with the causative marker, (49), and *do*-support is also possible in other contexts, for example in the predicate fronting examples discussed before in (25). At this point, it might still be the case that the observation is about the verb stem: it cannot be elided when it does not have a suffix attached to it. However, turning to aspect and tense combinations, this is not the correct generalization. In this case it is possible to have the equivalent of deleting the main verb, and only pronouncing the auxiliary, (51a), or pronouncing the whole

verb, (51c). Apart from the fact that the form of the auxiliary is different (/i/ versus /si/ in 49), the pattern is the same. However, the aspectual marker is different from the causative marker, in that the aspectual marker can be stranded, and also does not need to be hosted by an auxiliary, (51b).

- (51) Mei-wa nai-te i-ru no?
 Mei-TOP cry-ASP AUX-PRS Q
 ‘Is Mei crying?’
- a. Nai-te-wa i-ru (kedo, kanasin-de-wa i-na-i.)
 cry-ASP-TOP AUX-PRS but be.sad-ASP-TOP AUX-NEG-PRS
- b. ?Nai-te-wa i-ru
 cry-ASP-TOP AUX-PRS
- c. Nai-te-wa i-ru
 cry-ASP-TOP AUX-PRS
 ‘(She) is crying, but she is not sad.’

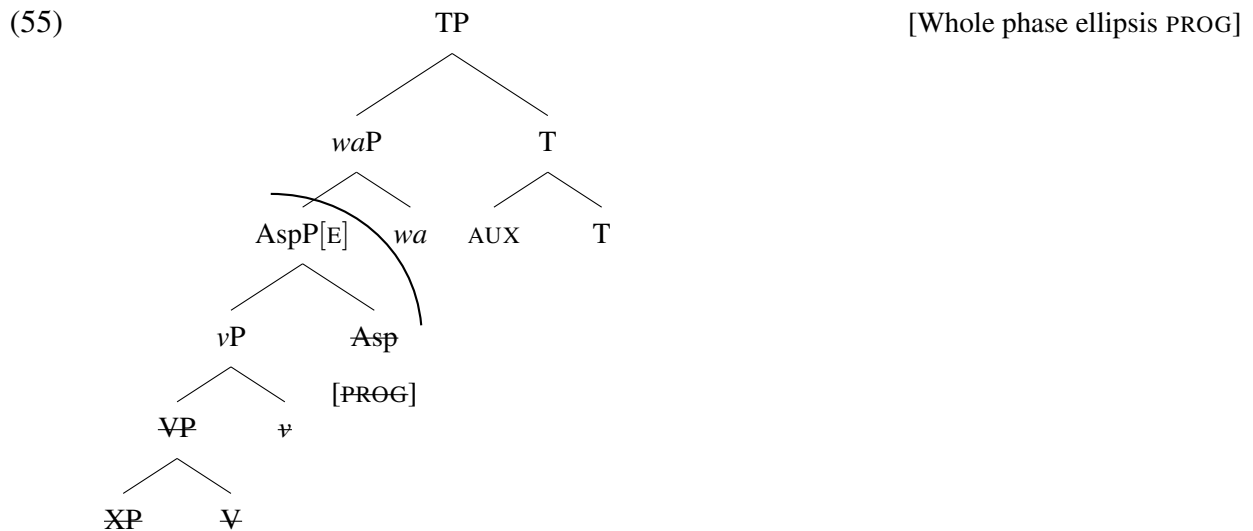
The distribution of *wa* is given in the examples below for the combinations discussed so far. For all cases, as mentioned above, it is possible to have the full verb present (the c. examples). It is in the elliptical contexts that variation arises. The focus marker cannot occur in between the verb and tense, (52), it can occur after aspect, (54), and it can occur after the causative marker, (53). Interestingly, it is not possible to elide the verb at all in simple tenses, (52b). Thus the question is why do-support is possible with the causative and the aspectual marker, even in some ellipsis contexts, but this is never possible with tense.

- | | | |
|---|---|--|
| (52) V { wa } T { wa } | (53) V caus wa T | (54) V ASP wa T |
| a. ✗ \forall wa T { wa } | a. \checkmark \forall eaus wa do-T | a. \checkmark \forall prog wa AUX-T |
| b. ✗ \forall wa do-T { wa } | b. ✗ \forall caus wa do-T | b. \checkmark \forall prog wa AUX-T |
| c. \checkmark V wa do-T | c. \checkmark V caus wa do-T | c. \checkmark V prog wa AUX-T |

What needs to be explained is why the progressive is the most flexible in being allowed to be the only pronounced morpheme (without being hosted by *do*) or being elided, whereas in the case of the causative the morpheme needs a host. Second of all, it cannot be solely the case that ungrammatical ellipsis patterns with the causative remaining or the tense morpheme remaining are due to the fact

that the verb does not carry an affix, since the progressive can remain pronounced, eliding the verb stem.

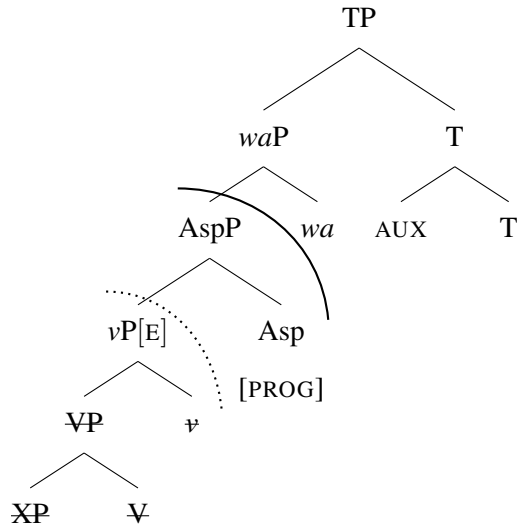
At this point, no unified analysis can be presented, but several points are indicative of where the analysis should go. The first point has to do between the status of the progressive as a phase head, and the theory of what is elided. Under the assumption that only phases can be fronted and elided, the aspectual head is a phase based on the data above. Recall that I assume that the progressive is a phase head, and the pattern above shows that the progressive head can, but does not have to be elided. Interestingly, in the ellipsis literature it has been argued that it is possible to account for various ellipsis patterns by either assuming that the whole phase is elided, or that the complement is elided (Holmberg 1999, 2001, Gengel 2007, 2008, Aelbrecht 2010, Bošković 2014, Todorović 2016). Under that assumption, the progressive data can be explained. This is exemplified in the structures below, where in (55) the whole phase is elided, but in (56) only the complement is elided and the aspectual head is stranded. I show what is elided with the [E] feature for which part of the structure can be marked for ellipsis.⁹



⁹The assumption that *wa* is merged lower than T is not that common. However, what needs to be explored is what the nature is of the aspectual phrase, i.e. if it is verbal or nominal. As mentioned in Ch 3., Sec. 3.2.3.1 on verb fronting, analyses have been put forward where certain topic or focus elements turn the complement into a nominal element. If that is the case then this verbal nature is not present anymore when T is merged and as such it cannot attach to the verb and needs to be hosted by an auxiliary (Saito 2006).

(56)

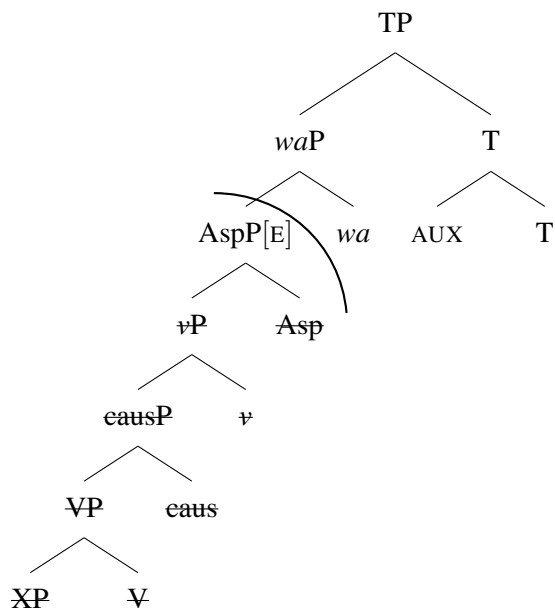
[Phasal complement ellipsis PROG]



This analysis can also explain the causative pattern. Recall that in this case the only grammatical options are either pronouncing the whole verb, including the aspect marker, or not pronouncing either. In this case it is not grammatical to leave the causative marker stranded. The causative is not a phase head, and as such does not have the flexibility the progressive head. Whether the complement or the whole phase is elided, the causative will in both cases be elided.

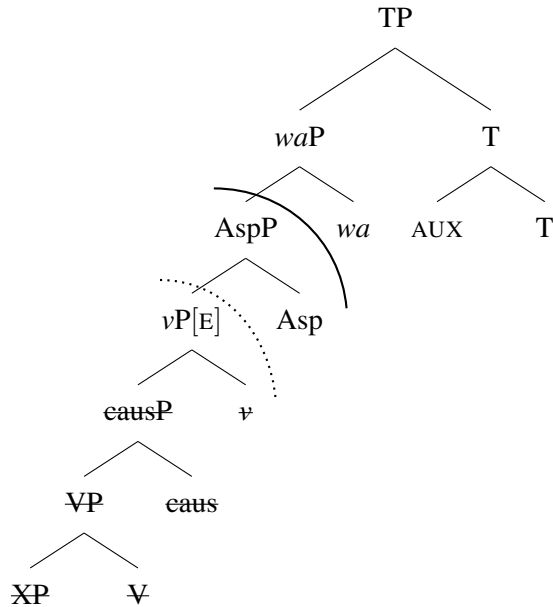
(57)

[Whole phase ellipsis Causative]



(58)

[Phasal complement ellipsis Causative]



Thus the minimal difference between the causative and the progressive is one about the status of the morpheme: being a phase head or not. Moreover, this can also explain the fact why T in these cases remains outside of the elided constituent: it is part of a higher phase. The remaining question at this point is why it is not possible to delete the verb, when there is only a tense head. Under the analysis presented here this should be possible. Even when there is no overt phase head in the morphology, it is still present in the syntax at the point of ellipsis. This is in fact the analysis of the causative above, (57-58). Moreover, it is possible to have the overt structure with only the verb stem and the topic particle.

Recall that a different way to look at the data above is to say that the verb stem cannot be stranded if it does not carry any affixes. Thus, the fact that the causative cannot be stranded, nor the tense form can remain outside of the ellipsis site in simple tenses is because the verb stem does not carry any affixes. This is informally represented as in (59). The fact that the causative and the tense head cannot be elided, is because the verb stem needs some type of inflectional material attached to it, and therefore (59a) is ungrammatical. However, if this is the solution to that problem, it means that in this case the progressive data are problematic: why is it that the progressive can be pronounced, eliding the verb stem?

- (59) a. ✗ $\sqrt{\text{root}}$ wa
 b. \checkmark $\sqrt{\text{root-voice/asp}}$ wa

To summarize, there is a split visible in verbal constructions with regard to particle ellipsis between three types of morphemes: voice, aspect, and tense. The tense morpheme always needs to be pronounced and cannot be elided, whereas aspect and voice can be elided. Interestingly, the aspectual progressive morpheme is flexible in that it can be pronounced, while the verb stem is elided. Under the assumption that only phases or phasal complements can be elided, the behaviour of the progressive can be explained under the proposal put forward here that it is a phase head. Moreover, this explains that material inside this boundary behaves different from material outside of this boundary. What remains to be solved is the question why there is a distinction between eliding only the verb stem, or the verb stem when it carries affixal material.

Finally, there is one type of morpheme that has not yet been not discussed in this section, namely *hajime*. Recall that these markers occur in restructuring contexts, and I analyzed them as spelling out a root in an aspectual head rather than a bound morpheme that needs a host based on various tests discussed in Chapter 2, Section 2.1.1. I argued there that they do form a single complex head with the main verb. Since they form a compound-like structure, where both the verb root and the aspectual head being a root, there is more freedom in syntactic contexts. For example, there is a difference between *hajime*-aspectual-roots and the causative or tense morpheme in conjunction behaviour. However, I also showed that they form a single complex head, and as such also pattern with causative or tense morphemes in that no material can intervene inside the verb with *hajime* morphemes. Returning to the particle ellipsis constructions, it means that various scenario's are possible. If they pattern with the causative marker in that it is not possible to strand *hajime*, it means that what is elided is always the complement of the phase. However, it is possible that the status of *hajime* as a root might lead to a different pattern. Since it is a root it might be expected that it can remain overt. This would then be slightly different reason than with the PROG head, since I argued that that head can remain because it is the phase head.

Unfortunately, the data are not that clear. The pattern is summarized in (60). As was the case

for the causative and the progressive, it is possible to elide the main verb and *hajime*, (60a), and it is also possible to not elide anything, (60c). The judgements for the main verb being elided and *hajime* remaining overt are not clear: they are not ungrammatical, nor are they grammatical, (60b). So, there is a difference with both the progressive which is grammatical, and the causative which is clearly ungrammatical. However, it would be unfair to assume that *hajime* patterns with one type to make the analysis better (which I am not sure which option that would be at this point).

(60) Mei-wa naki-hajime-ta no?

Mei-TOP cry-begin-PST Q

‘Did Mei begin to cry?’

a. ~~naki-hajime~~-wa si-ta (kedo, kanasin-de-wa i-na-i)
cry-begin-TOP do-PST but be.sad-ASP-TOP AUX-NEG-PRS

b. ~~?~~naki-**hajime**-wa si-ta
cry-begin-TOP do-PST

c. Naki-**hajime**-wa si-ta
cry-begin-TOP do-PST
‘(She) did begin to cry, but she is not sad.’

To summarize, I discussed a pattern regarding ellipsis in focus constructions in Japanese. I showed that there is an asymmetry between tense, aspect, and causative marking and provided a direction for an analysis where the behaviour of this split can partially be explained by following proposals that phases or complements of phases can be elided, and that the progressive head is the phase head. It remains to be seen what the status of *hajime* is, but I provided two alternatives. It will be interesting to see how these patterns relate to nominalizations and other type of constructions where verbs can be used in different contexts and which material can be part of it. That is, it has been assumed in fronting patterns that the fact that tense is expressed as a form of *do* is due to the fact that its complement is a nominal structure rather than verbal (Saito 2006). If that is the case in some fronting patterns, it might also shed light on the fronting patterns with topic particles and the ellipsis patterns discussed here.

4.2.3 VP ellipsis and adverb interpretation

One of the observations used by Harwood to argue for the split between progressive being part of the inner phase and the perfect and higher material being outside of this comes from various patterns in VP-ellipsis constructions. The assumption is that only phases (or complements of phases) can be elided, and under the assumption that the progressive is a phase head, there should be a split with material above and below this phase head. In this section I discuss the patterns discussed by Harwood for English, and also point to the data discussed in the previous chapter regarding mismatches in VP ellipsis constructions. I show that the mismatch patterns fit with the proposal made here, but the ellipsis patterns require additional explanations. Then I focus on Japanese. This language does not have the same type of VP ellipsis as English, but it does allow for a version with do-support. Crucially, I show that there is an asymmetry with regard to adverb interpretations that are (dis)-allowed in these ellipsis constructions. I hypothesize that this pattern can also be accounted for under the phasal approach presented for English. Moreover, this makes interesting predictions as to whether certain readings are possible in ellipsis contexts, which I show are borne out.

4.2.3.1 English

There are two observations that are relevant here. The first have to do with auxiliary patterns in ellipsis contexts, and the second has to do with inflectional mismatches. The data from Sec. 4.1.1 are repeated here. The set of observations go back to Akmajian and Wasow (1975) and Sag (1976). With an English expression that consists of a modal, a perfect, a progressive, and a passive auxiliary and a main verb, (61), there are several restrictions on which auxiliaries can or cannot elide. Thus, in a sentence as (61), it is never possible to elide *have*, (61a), while *being* must be included in the ellipsis site.

- (61) Scary Spice must have been being hassled by the police, and . . .
- a. *Sporty Spice must ~~have been being~~ hassled by the police, too
 - b. Sporty Spice must have ~~been being~~ hassled by the police, too

- c. Sporty Spice must have been ~~being hassled by the police~~, too
- d. *Sporty Spice must have been ~~being hassled by the police~~, too

As mentioned in the previous section, Harwood (2014) and Aelbrecht and Harwood (2015) analyze this data as follows. Since the progressive always is included in the ellipsis site, but never is, there is a cut-off point between the progressive and the perfect for what can be elided. Following analyses that phases are elided with VP ellipsis, means that the progressive is part of the ellipsis site, but the perfect is not. An immediately problem for this approach is the fact that the perfect auxiliary can optionally be elided as well. The reason that *been* can be elided, they assume, is due to a difference in location for this auxiliary, and they provide evidence that *been* can raise, but does not have to. If that is the case, then the perfect is not a problem. However, there is an issue in relation to the passive. That is, it is not a surprise that the passive is elided if it is part of the inner phase. What is a problem for the approach taken here, is that the passive is expressed as an auxiliary. If the passive is a head in the clausal spine, like other heads, then it is a surprise that verb movement stops before it reaches the progressive phase. This issue will be discussed in more detail in Sec. 4.2.1, since the focus here is not on the auxiliary formation.

The second piece of evidence that has been put forward in relation to ellipsis and the split between material inside the progressive and outside the progressive is mismatches in inflectional material. This was also discussed in Ch. 3, Sec. 3.3.1. I showed, based on data from Quirk et al. (1972), Lasnik (1995b) that there is an asymmetry between the progressive on the one hand, and tense and the perfect on the other hand. The data for the perfect and the progressive are repeated below. As shown, it is possible to have mismatches for the perfect, but not for the progressive when the ellipsis site contains the progressive but the antecedent does not.

- (62) a. Baby Spice was **sleeping** and Ginger Spice will **sleep**, too (Lasnik 1995b)
- b. *Baby Spice **slept** and Ginger Spice was **sleeping**, too
- c. *Baby Spice will **sleep** and Ginger Spice is **sleeping** now
- d. *Baby Spice won't **enter** the competition, but Ginger Spice is **entering** the competition

- (63) a. Posh Spice may be **questioning** our motives, but Ginger Spice hasn't ~~questioned~~ our motives
- b. Ginger Spice **saw** your parents last week, but she hasn't ~~seen~~ your parents since

(Lasnik 1995b)

Thus, the pattern is that perfect and simple tense morphology can mismatch, whereas progressive morphology cannot when it is in the ellipsis site. I follow Harwood (2014) that this is expected when the progressive can be part of the phase, but higher material is not. The fact that (62a) is grammatical is because the antecedent is bigger than the ellipsis site, which does not contain the progressive. The fact that the remainder of the sentences in (62) are ungrammatical, is because the antecedent does not contain the progressive. As such, the ellipsis site is bigger than the antecedent, since it needs to contain the progressive. This then leads to ungrammaticality. The fact that the perfect does not fit this pattern is because it is recoverable, and it is always outside of the first phase and thus always outside of the ellipsis site.

Before moving to Japanese, let us turn to a problem. This is the same problem as noted for the auxiliary patterns and VP ellipsis, namely the passive. Under the proposal that material inside the first phase should never mismatch, the prediction is that the passive should not be allowed to mismatch either. However, as Harwood (2014) points out, this is a problem, since voice mismatches have been reported by (Merchant 2008), (64). It is possible to have a mismatch between an active and passive verb, and vice versa.

- (64) a. Active-Passive

The janitor must remove the trash whenever it is apparent that it should be removed

- b. Passive-Active

The system can be used by anyone who wants to use it (Merchant 2008, 169)

This should not be allowed, if it is the case that voice is always inside the ellipsis site. That is, voice should pattern with the progressive and not with the perfect or tense. Interestingly, there has been a discussion in the literature about whether voice mismatches are allowed in all cases (Kehler

2002, Merchant 2013). It has been argued that voice mismatches are generally disallowed, but only allowed with specific discourse contexts. Thus, the more general pattern is as in (65).

(65) *John will penalise someone unfairly, but Mary won't be ~~penalised-unfairly~~

(Thoms and Walkden 2013, 35)

Even if it is the case that a specific context is needed to allow for these mismatches, it must mean that the grammar can generate these structures. If that is the case, this is a problem under the assumption that the passive is a head in the clausal spine which is placed inside the progressive phase. I do not offer a solution for this problem here, but in Sec. 4.2.1 I offer various directions regarding the passive and the nature of the syntax of passive constructions (see also Ch 5, Sec. 5.2.1.1)

To summarize, it means that in English ellipsis there is evidence towards a split between the progressive and higher material in two cases: with auxiliaries there is a split as to which auxiliaries can be elided. With lexical verbs there is a split whether mismatches are allowed. However, this split requires more scrutiny, since the passive is not predicted to mismatch if it is included in the phase.

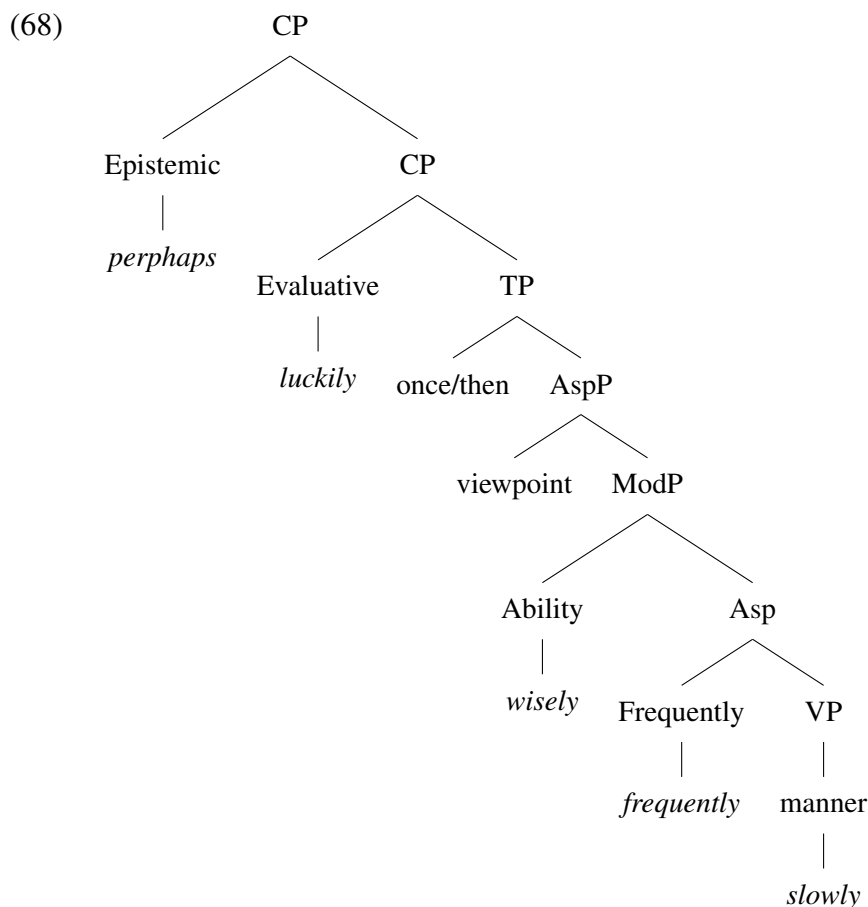
4.2.3.2 Japanese

This section focuses on specific readings that are allowed in Japanese VP constructions. I show that initial data point to a similar divide as discussed in English, that the progressive behaves differently than tense in ellipsis contexts. Japanese does not have the same type of VP ellipsis where everything is elided and no other material is inserted. However, Japanese does have VP ellipsis with *soo-da*, a form of the present affirmative, and a pro-form for the elided material, (66). It also has VP ellipsis with the same pro-form, and *do-support*, (67). The data presented here come from Mori (2015b,a), but has been discussed in various places (Hinds 1973, Makau 1973, Tanaka 2016, a.o.) .¹⁰

¹⁰What needs to be investigated when VP ellipsis as discussed in this section takes place, and when VSE, discussed in the previous chapter, takes place. The question is if there are different syntactic configurations, or if one or the other ellipsis option is chosen with regard to different pragmatic factors.

- (66) a. Hiroshi-ga tegami-o sute-ta
 H.-NOM letter-ACC throw.away-PST
 ‘Hiroshi threw away the letters’
- b. Masaru-mo soo-da
 M.-also so-AFFIR.PRES
 ‘Masaru did so, too’ (Mori 155)
- (67) a. Hiroshi-ga tegami-o sute-ta
 H.-NOM letter-ACC throw.away-PST
 ‘Hiroshi threw away the letters’
- b. Masaru-mo soo-si-ta
 M.-also so-DO-PST
 ‘Masaru did so, too’ (Mori 2015: 155)

The question that is of interest here, is what the pro-form *soo* is substituting for, i.e. what structure in the clausal spine is deleted, and if it is the same structure in both cases. It turns out that there is an asymmetry in what is elided when adverbs are used. Various studies have looked at Japanese adverb order (Nakau 1984, Noda 1984, Endo 2007, Fujimaki 2009) and show that there is a hierarchy, similarly to the one discussed in (Cinque 1999). For the purpose here, there are 5 types of adverbs used, two high adverbs, in the mood/ high modality domain, above TP. Then there are three adverbs that in the Cinque hierarchy occur below TP, one relating to low modality, one to low aspect, and one to VP. Crucially, this Low modality marker still occurs below certain aspectual heads in the cinque hierarchy, but I could not find a higher Aspectual marker. These adverbs, *wisely* or *intentionally* have been used in the previous chapter to indicate different heights of the verb in English and Greek, where in English the verb occurs below these adverbs, but in Greek the verb move past it. This hierarchy is abstractly summarized in the tree below.



These 5 adverb types can be used with the two types of VP-ellipsis in Japanese and yield different results, as shown by Mori (2015b,a). First, when looking at the ellipsis with the affirmative marker, it is possible to elide the object, and have the ellipsis site modified by *perhaps luckily*. However, it is not possible to modify this with any lower adverbs, such as low modality, aspect or manner adverbs, (69).

(69) Hiroshi-wa ringo-o tabe-ta
 H.-NOM apple-ACC eat-PST
 'Hiroshi ate the apple'

- a. Masaru-mo tabun soo-da [Epistemic]
 M-also perhaps so-AFFIR.PRES
- b. Masaru-mo kouun nimo soo-da [Evaluative (High Mod)]
 M-also luckily so-AFFIR.PRES
- c. *Masaru-mo kasikoku mo soo-da [Ability (Low Mod)]
 M-also wisely so-AFFIR.PRES
- d. *Masaru-mo hinpan ni soo-da [Asp]
 M-also frequently so-AFFIR.PRES

- e. *Masaru-mo yukkuri soo-da [Manner (VP)]
 M-also slowly so-AFFIR.PRES

I take this to mean that the ellipsis site must include at least all heads below tense, but not above this. Moreover, it must be able to include adjuncts (or specifiers), and thus it seems that the whole phase is elided in order for the adverbs not to be pronounced. Note that the cut-off point is similar in English: the verb cannot raise past the aspectual head. This makes the prediction that for this type of ellipsis it is not possible to pronounce the aspectual head, i.e. the progressive, since it is the phase head in my analysis. This prediction is in fact borne out. An aspectual reading is allowed in the following sentence, (70), even though the aspectual morpheme cannot be pronounced, (71a), and is in fact ungrammatical when overt, (71b).

- (70) Hiroshi-wa ringo-o tabe-**te** i-ta 'Hiroshi is eating an apple'
 H.-NOM appl-ACC eat-PROG AUX-PST

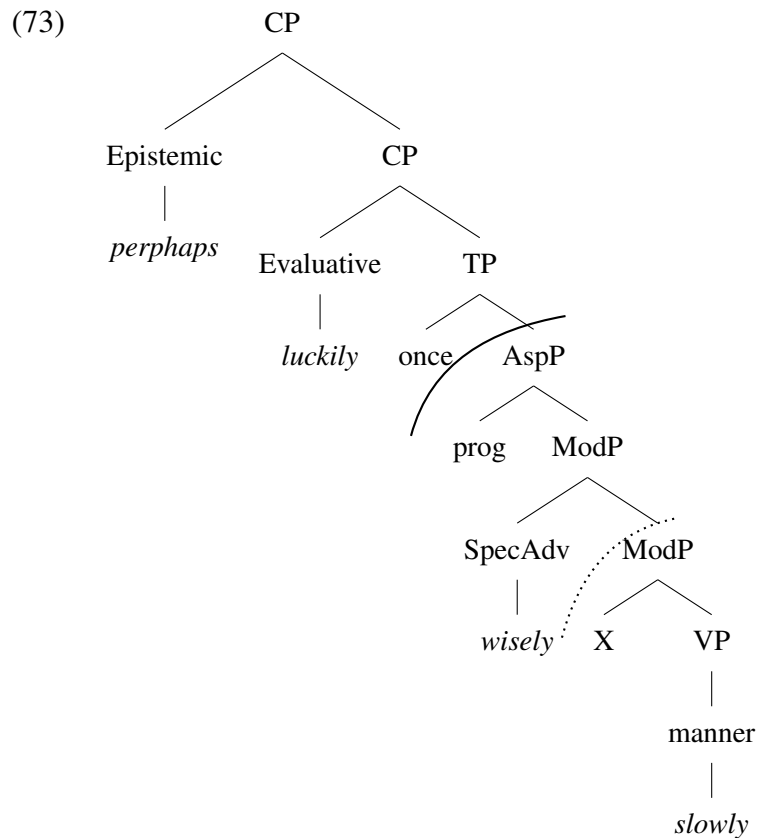
- (71) Intended: Masaru is also eating

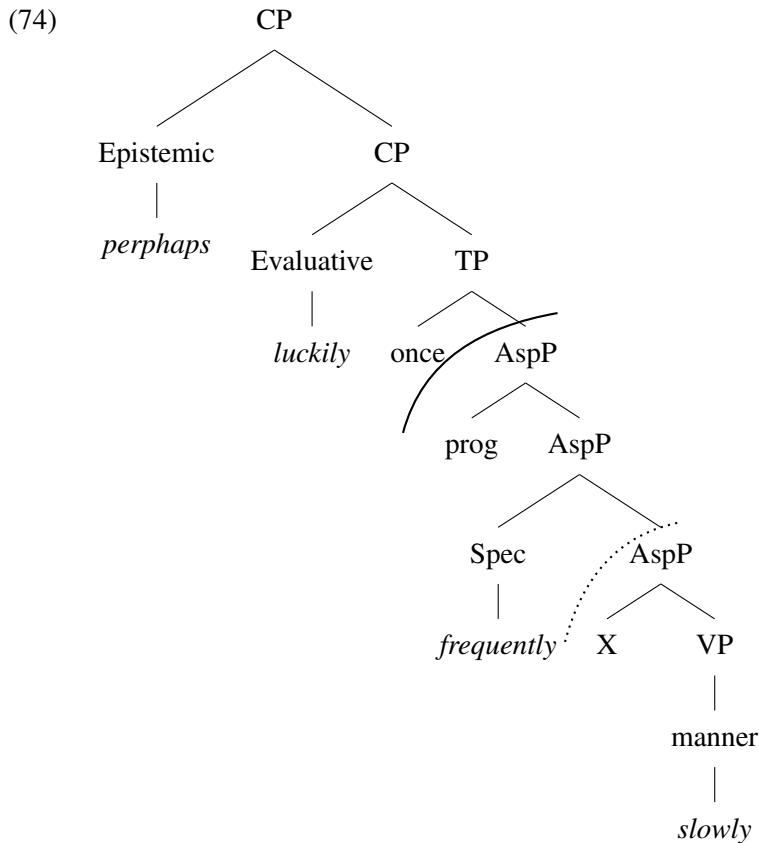
- a. ✓ Masaru-mo soo-da
 Masaru-also so-AFFIR.PRES
 b. *Masaru-mo soo-**te**-da
 Masaru-also so-PROG-AFFIR.PRES

Turning to the other type of ellipsis, with do-support, it seems that much more adverbs are acceptable. (72). That is, only manner adverbs cannot be pronounced, but any other type of adverb can be used to modify the sentence.

- (72) Hiroshi-wa ringo-o tabe-ta
 H.-NOM apple-ACC eat-PST
 'Hiroshi ate the apple'
- a. Masaru-mo tabun soo-si-ta [Epistemic (Mood)]
 M-also perhaps so-DO-PST
- b. Masaru-mo kouun nimo soo-si-ta [Evaluative (High Mod)]
 M-also luckily so-DO-PST
- c. Masaru-mo kasikoku mo soo-si-ta [Ability (Low Mod)]
 M-also wisely so-DO-PST
- d. Masaru-mo hinpan ni soo-si-ta [Low Asp]
 M-also frequently so-DO-PST
- e. *Masaru-mo yukkuri soo-si-ta [Manner (v/VP)]
 M-also slowly so-DO-PST

If it is the case that this type of ellipsis is also sensitive to phase-hood, it raises questions how this type of ellipsis works. It is not clear that this is a clear case of the complement of the phase head, if the phase is always aspect, since there are adverbs in lower positions that can remain. However, it might be possible on the assumption that not all heads are always present, but then it must mean that the adverbs can remain. Thus, in case of the modality adverb, there is no aspectual head, and conversely, in case of the aspect adverb there is no modality layer in the syntax, (73 vs. 85). However, this must mean that complement of the phase here is interpreted, as not including the specifier of the complement.





If this is on the right track, it makes the prediction that (i) the progressive head must remain outside of the ellipsis site, and that (ii) the other aspectual or modality head can remain outside the ellipsis site, but does not necessarily has to. The prediction regarding the pronunciation of the progressive head is borne out. The pattern here is the opposite of the pattern with *soo-da* in that the progressive can be pronounced, (75).

(75) Hiroshi-wa ringo-o tabe-**te** i-ta 'Hiroshi is eating an apple'
 H.-NOM appl-ACC eat-PROG AUX-PST

(76) Intended: Masaru is also eating

- a. ✗ Masaru-mo soo-si-ta
 M.-also so-do-PST
- b. ✓ Masaru-mo soo-si-te i-ta
 M.-also so-do-PROG AUX-PST

To summarize, I looked at both English and Japanese ellipsis phenomena. I have shown, following Harwood, that in English there is a split between the progressive and higher material with regard to auxiliary ellipsis and mismatches that are allowed, even though there is a problem with

the passive. In Japanese I looked at a slightly different phenomenon, and used adverbs to show how big the ellipsis site is. Crucially, what I have shown is that in Japanese there is a split between adverbs that are part of the tense domain, and adverbs that are part of the lower domain. Adverbs that are part of the aspectual domain are not licensed in an ellipsis with *soo-da*, and I argued that this is due to the ellipsis involving the whole phase including aspect, whereas the ellipsis site for *soo-su* is smaller. I tested this by looking whether a progressive reading was allowed or not, and this prediction is borne out. Thus, a correlation exist between the size of the constituent that is picked out in ellipsis and the size of the verb-word in auxiliary and synthetic verb forms, which is indicative of both of these properties following from the same boundary in the syntax: a phase.

4.3 Auxiliary formation and intervention

Up until this point I provided an analysis of periphrasis in terms of phases. This is different from proposals in the literature where periphrasis is mediated by Agree or a Selection. I discuss these alternatives in this section, and point out similarities and differences. The focus in this dissertation is mostly on a pattern of auxiliary formation where a functional morpheme needs to be hosted by a dummy auxiliary—an element that itself does not contribute any meaning but is there to host an inflectional element. This is shown abstractly in (77), where the verb can host a feature, but any other morphemes need to be expressed on auxiliaries. When all morphemes are combined, two auxiliaries are needed. This is represented for English, where the progressive can be marked on the verb, and tense needs to be hosted by an auxiliary; and in case there is a past perfect progressive, there is an additional auxiliary for the perfect. Thus, in this sense there is an *additive* pattern of auxiliary formation.

(77) a. [AUX- x] [V-z] [Additive Pattern]

b. [AUX- x] [AUX -y] [V-z]

(78) a. She [**is**] [walking] [English]

b. She [**has**] [**been**] [walking]

This is different from a pattern where each morpheme can be expressed on the verb, but a combination of the two morphemes is not possible and an auxiliary is needed. This is abstractly shown in (79), where *x* and *y* are functional morphemes that need to be hosted, and can be hosted by the verb separately, but not when both are combined, in that case one of the morphemes needs to be expressed on an auxiliary. This is exemplified for Kinande in (80) for the progressive and the past.

- (79) a. ✓ [V -x] Overflow Pattern
 b. ✓ [V -y]
 c. ✗ [V -x -y]
 d. ✓ [AUX -y] [V -x]
- (80) a. [tu -ne:mu -húma] [Kinande]
 1.PL -PROG -hit
 ‘We are hitting’
- b. [tw -á -húma]
 1.PL -PST -hit]
 ‘We hit (recently, not today)’
- c. *[tw -á -ne:mu -húma]
 1.PL -PST -PROG -hit]
- d. [tw -á -bya] [i -tu -ne:mu -húma]
 1.PL -PST -AUX L -1.PL -PROG -hit
 ‘We were (recently, not today) hitting.’ (Bjorkman 2011, p.87)

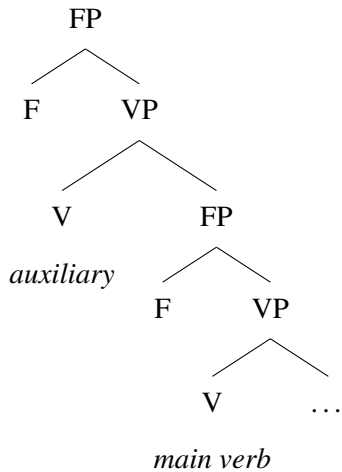
Specifically this last pattern has taken to mean that it is in fact the feature content of the morphemes that is causing this pattern. The pattern has been called a type of *feature intersectivity* (Ackerman and Stump 2004), where no single, individual feature can be the cause of periphrasis, or an *overflow pattern* (Bjorkman 2011, 2014). The pattern has received various types of morphological and syntactic analyses (Ackema 1995, Embick 2000, Ackerman and Stump 2004, Kiparsky 2005, 2010, Bjorkman 2011, 2014, 2017, Arregi and Nevins 2012, Aranovich 2015, Kastner and Zu 2017, Pietraszko 2017, 2018, Davis 2018, Calabrese 2019, Fenger 2019). What these analyses have in common is that auxiliary patterns are due to competing features that cannot be expressed inside a single word. The proposals can be roughly grouped into morphological and syntactic approaches.

One group of proposals assumes that the formation of synthesis and periphrasis is done in the morphology, and involves some type of paradigm gap. The other group of proposals assumes that the synthetic-periphrastic alternation is in fact sensitive to the syntax. The most prominent proposals involve either a type of head movement or some form of intervention. What plays a role in most of the proposals in some form is (i) markedness of inflectional features, (ii) the formation and failure of words, (iii) locality of features. The proposal in this dissertation takes a syntactic approach to auxiliaries, and is very close to two recent proposals that assume that auxiliary patterns are derived via a form of intervention (Bjorkman 2011, Pietraszko 2017). I will discuss these proposals in more detail and point out why the proposal in this dissertation focuses on domains rather than intervention, and provide a prediction that will be explored in the next chapter.

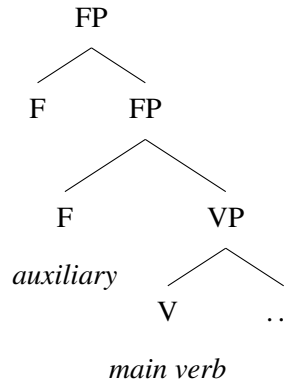
Bjorkman (2011) first of all argues, based on the existence of the overflow pattern, that auxiliaries cannot always be primitives in the syntax and arise as a rescue strategy to provide a host for stranded features. She shows that most proposals considering auxiliaries look at (77). In order to account for additive patterns many have assume that auxiliaries are VP or AuxP projections in the clausal spine that are selected by different functional heads. (Chomsky 1957, Ross 1967, 1969, Huddleston 1974, Akmajian and Wasow 1975, Akmajian et al. 1979, Emonds 1978, Pollock 1989, Déchaine 1993, 1995, Kayne 1993, Roberts 1998, Rothstein 1999, 2004, Schütze 2003, Iatridou et al. 2003, Pancheva 2003, Embick 2004, Harwood 2014). This is represented in (81), where a functional projection (FP) can select for an additional VP or Aux that is the auxiliary. Because the overflow pattern in (79) shows that a single morpheme by itself cannot be associated with always being an auxiliary or always being an affix on the verb (compare 79b with 79d), Bjorkman follows approaches where auxiliaries are not dedicated positions of the clause (82), but arise through the presence or absence of other functional material, (82), (Hoffman 1966, Bach 1967, Tenny 1987, McCawley 1988, Embick 2000, Arregi 2000, Cowper 2010)¹¹

¹¹There is a distinction between approaches that assume that auxiliaries are directly inserted into the FP, mainly used for restructuring verbs, (Cinque 1998, 1999, 2001, Wurmbrand 2004, Grano 2012), and approaches that assume that auxiliaries are a last resort option (Dik 1983, 1987, Déchaine 1993, 1995, Schütze 2003, Cowper 2010). Bjorkman argues that the overflow pattern follows from the latter type of approach.

(81) AUX = VP



(82) AUX = FP



In the overflow pattern, there is no single functional projection that selects an auxiliary, but the auxiliary is selected by a combination of functional heads. If the V/AuxP analysis were used to explain the overflow pattern the pattern would look as in (83).

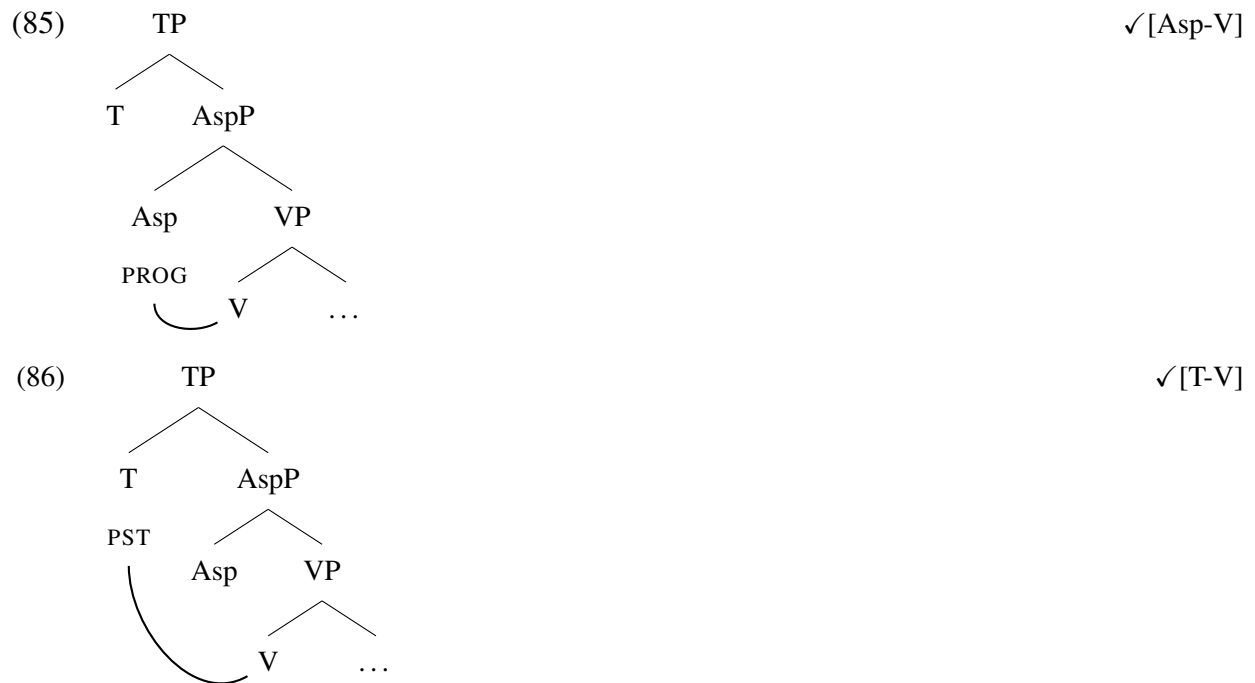
- (83) a. ✗ [AuxP [YP]]
 b. ✗ [AuxP [XP]]
 c. ✓ [AuxP [YP [XP]]]

The problem with this, Bjorkman argues, is that the selectional relationship in (83c) is non-local, and as such warrants an analysis where auxiliaries are not primitives in the syntax. Moreover, (Pietraszko 2017) also shows that under a auxiliary=VP analysis, we would expect effects of argument structure, as is commonly associated with verb phrases (following Pollock 1989, Carstens and Kinyalolo 1989). Thus, an auxiliary verb can be defined as follows (from Pietraszko 2017, p.30).

(84) *Auxiliary Verb*: A verbal element which does not have an extended projection of its own, but rather occupies some position in another verb’s extended projection.

Based on this, Bjorkman argues for a syntactic approach to auxiliary formation where a default auxiliary is inserted in the context where the higher functional head cannot combine with the verb.

Bjorkman takes this to mean that auxiliary formation is sensitive to the syntax. Her proposal, and that of (Pietraszko 2017, 2018) assume that auxiliaries are a repair to the failure of syntactic heads to combine with the verb. They model this as a type of intervention, a form of relativized minimality (Rizzi 1990). The main idea is illustrated for the Kinande data in (80). When there is only a single feature expressed, the clausal spine only expresses this feature. This feature can combine with the verb, (85-86). In Bjorkman's system this is done via a version of Agree (Chomsky 2000, 2001), namely Upward Agree (Merchant 2011, Wurmbrand 2012b, Zeijlstra 2012, Bjorkman and Zeijlstra 2019); in Pietraszko's system this happens through a type of selection, similar to cyclic agree (Béjar and Rezac 2009), following similar systems in Cowper (2010), Adger (2010), Adger and Svenonius (2011). However, the combining of the features is not possible, because in 87 the aspect feature intervenes for the tense feature to be agreed with/checked.





After the failure of checking/Agree, the tense feature remains stranded and cannot be combined with the verb. In order to rescue this derivation, a host is inserted for the stranded feature, in this case an auxiliary. An obvious advantage of such an approach over a morphological one is that the formation of auxiliaries follows the hierarchical structure: it is expected that when there is a higher and lower head, the lower head will end up on the verb, whereas the higher head ends up on the auxiliary. For Bjorkman head movement interacts with Agree, in that only heads or features that have Agreed, are allowed to move. However, this can then void the intervention effect. In order to solve this problem, Bjorkman stipulates how many steps of head movement a language is allowed to make. The proposal in this dissertation builds on this observation for head movement, by proposing that it is possible derive the amount of head movement that is allowed, and the auxiliary patterns that arise, form a syntactic boundary and the timing of head movement before or after material is sent to the interfaces.

Languages that have been successfully described with such a system are the following: English, Kinande, Basque, Finnish, French, Romanian, Arabic, Latin (Bjorkman 2011); Shona (Aranovich 2015)¹² Ndebele (Pietraszko 2017); Azeri (Davis 2018). Despite variation in which features count as interveners, what all of these languages have in common is that overt Aspectual and overt Tense material can never be combined in the same word.¹³ Thus, a language can only have the overflow pattern, like Kinande above; languages can be hybrid, like English in that simple tense can be combined on the verb, but when there is one or more aspectual values (progressive and perfect), it is

¹²Aranovich does not assume the same type of approach as Bjorkman, but presents the same argument in a Lexical-Functional-Grammar approach.

¹³Romanian is the only language that only has auxiliaries for Mood, but not for lower heads.

possible to know that these values need to be expressed as an auxiliary; ; and languages can always be additive because it is possible to determine based on the feature value if they require an auxiliary.

The domain approach taken here is thus close to the intervention-type approaches of Bjorkman (2011) and Pietraszko (2017). In both approaches it is possible to derive simple synthetic tense forms, and the auxiliary patterns generally arise from a combination of features. In the dissertation here, the interaction of features is related to the spell-out of a phonological word or not. One reason to argue for the domain approach has been the prevalent boundary between tense and aspect: In most of the languages discussed in the literature on auxiliary formation there is a cut-off point for features to combine after Aspect. Under an intervention approach where each feature could in principle be intervening, it is surprising that the boundary shows up so readily between aspect and tense. A prediction that will be tested in the following chapter is related to this. Under a domain approach, if head movement is available on the first cycle, and can only be stopped by the phase head when it applies after spell-out, predicts that heads inside the first domain should always be affixal. This is not predicted under an intervention approach. As I will show, this is indeed the case when doing a cross-linguistic study of 33 languages from 15 families and 3 isolates. That is, valency changing morphology and lexical aspect, when they are expressed as an affix and not as a free, root-like, morpheme (like *make* or *begin*) never participate in periphrasis. However, there is one exception to this pattern: the passive.¹⁴ The only type of voice category that can ever be expressed with, what seems like, a dummy-auxiliary, is the passive. As also pointed out in the previous section, the passive in English also seems to allow mismatches in ellipsis, even though it is inside the phase. I discuss briefly how to deal with this counterexample in the domain based approach for English, and return to this again in the next chapter.

4.3.1 Voice, Passive and phases

As noted at various points in this chapter, the passive constitutes a problem for the proposal made in his dissertation. Specifically, passives in English. As shown in (88) there is a periphrastic

¹⁴See also Haspelmath (1994) for a discussion of passives cross-linguistically.

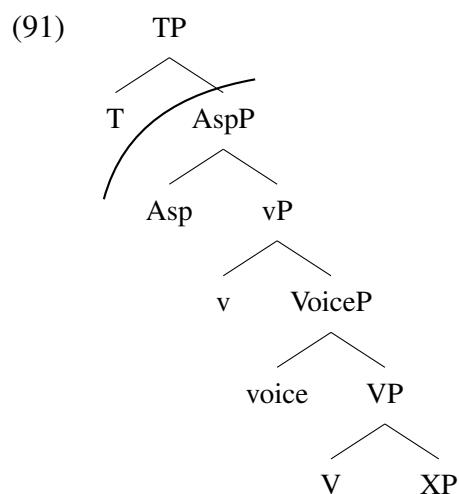
construction for the passive. This is not the case in Japanese or Turkish, (89-90).

(88) The golden compass **was stol -en** from Lyra

(89) [mesiagar **-rare -ru**] [Japanese]
eat.HON -PASS -PRS
'It is eaten (by him)'

(90) [keşf -ed **-il -'di**] [Turkish]
discovery -do -PASS -PST
'x was discovered (by y)'
(based on Kornfilt 1997, 323)

Under the approach put forward here, where aspect counts as a phase, I assumed that a phase head can block head movement. Thus, if that is the case, it means that material inside that phase should be able to head move without any issues. However, if that is the case, a periphrastic passive is then unexpected, as in English, since it would be part of the inner phase, (91).



The remainder of this section discusses two directions for a potential solution. The first has to do with the height of the passive morpheme in the clausal spine and the status as a phase head or not, and the second option deals with the idea that the syntax of the passive might be underlyingly different from other periphrastic constructions.

First of all, up until this point, I assumed that the voice morphology is expressed in a head above the VP, as is also represented in (91). However, the passive(voice) phrase has also been argued to be the highest projection in the verbal/argument domain, above other valency changing morphology,

and in some cases has been taken to instantiate a phase head. (Kratzer 1996, Pylkkänen 2002, 2008, Collins 2005, Alexiadou and Doron 2012, Bruening 2013, Legate 2014, Sundaresan and McFadden 2017). If it is the case that the passive voice is in fact the highest head in the extended domain, it is possible to assume that it is a phase head, as I assumed for the progressive. In this scenario, if there is a passive head merged in the structure, head movement in English still happens after spell-out, and therefore stops as high as the passive phase. Moreover, when this phase head is not present, Aspect will count as the phase head, which allows for simple tense forms and progressive tenses (following a dynamic approach to phases). This, however, leads to a problem for languages like Turkish and Japanese where there is no periphrastic passive.

Under such an approach, the language variation with regard to affixal or periphrastic passives would be due to the timing of head movement and spell-out. This is then similar to the discussion in the previous chapter in relation to V-to-T movement in Greek and the absence of such movement in English or Japanese. Note that this means, in the same vein as in the last chapter, that this proposal predicts variation in other phenomena than auxiliaries, for example with regard to matching constraints in ellipsis, and extraction. Moreover, it would mean that language internally there is variation as to how head movement is ordered with respect to a particular phase: In English head movement is always ordered after material is sent to spell-out, which means there are auxiliaries starting from the passive. In Japanese or English this would mean that the order is variable: in case of the passive, head movement is ordered before spell-out, but in case of the aspectual phase, it is ordered after spell-out.

The second direction that could be explored does not maintain that the passive is in fact the same in the syntax as all the other phrases in the clausal spine. That is, in order to maintain a domain approach to word-building a different reason for periphrasis should account for the passive. In fact, there is an idea in the literature that the passive involves a small clause or restructuring predicate, and that *be* is in fact a lexical verb rather than a dummy-element hosting the tense morphology (Ross 1969, Akmajian and Wasow 1975, Baker et al. 1989, Lasnik 1995a, a.o.). In this case the cause of periphrasis might not be due to phases. For example, there are many cases of periphrasis

that involve a light-verb construction rather than a dummy auxiliary that hosts an affixal morpheme. The causative in English is an example of this, (92).

(92) Lyra **makes** her Daemon Pantalaimon **sleep** on her shoulder

In this example the main verb is in infinitive form and the auxiliary is *make*. These cases have been analyzed as a type of complementation structure and the auxiliary as a type of more lexical element that can stand on its own. In this case the cause of periphrasis might not be because certain features cannot be combined, but it might be because of the nature of the causative morpheme itself: it is a light verb rather than a bound morpheme. In fact, differences between *be* in English in the progressive and the passive have been noted in the literature, and accounted for in a similar way, by assuming that *be* in the passive is a lexical verb rather than a dummy auxiliary (Ross 1969, Akmajian and Wasow 1975, a.o.). If that is the case, the variation between affixal and periphrastic passives can be explained in two ways: either the building blocks are the same (all passives are light verbs), or the building blocks differ (some have restructuring passives, other languages do not).

In the first scenario, where the building blocks are the same, it means that all languages express the passive as a light-verb. If languages are always the same with regard to how a specific category is expressed, then the prediction is that in a language like Japanese and Turkish the passive is a root-like element, rather than a bound affix that always needs a host. In other words, the passive would behave similarly to the *hajime*-morphemes in Japanese, which in fact has been discussed as an option. The language variation in this case comes from the complex head creation of root combinations in some languages, whereas this is absent in other languages. This means that in all the languages the building blocks for the passive are the same, but the movement operations might differ. This then predicts that the passive in all these languages would behave the same, even though in some languages they end up in a single morphological domain. A different option would be that the building blocks do differ: there are languages like English, which have a passive with a different syntactic structure than other functional material, and there are languages that are like Japanese and Turkish. This predicts that there are independent syntactic differences (see for example Schäfer (2017) on the typology of voice in romance passive constructions or (Engdahl

1999, a.o.) for morphological and periphrastic passives in Scandinavian.).

To summarize, as it stands, under the approach taken here where only aspect counts as a phase boundary, the periphrastic passive in English is a counter-example. I have provided two directions which can be tested: either by assuming that voice counts as a phase and head movement is timed differently, which predicts variation in ellipsis contexts. The other direction I provided has been discussed in the literature as well, and assumes that the passive is syntactically different underlyingly from other periphrastic constructions.

4.4 Conclusion

This chapter focused on a specific assumption in the theory presented in this dissertation. Namely that periphrasis is a side effect of marked aspectual phase heads, following proposals that argue that word building can be delimited by phases. I presented first an overview for arguments why aspect can be part of the inner phase, and discussed various options for how phases interact with spell-out. After this, I presented three arguments for similarities between auxiliaries and phrasal phenomena, based on Harwood's work on English. First of all, I showed that the constituent that can be fronted in English and Japanese is an aspectual phrase, and that tense remains outside of this constituent. Second, I showed that the placement of particles in Japanese and Turkish is indicative of a split between aspect and tense as well. Third, I discussed correlations with regard to the size of ellipsis in Japanese and the available adverb readings, and the size of the auxiliary. The data indicate that a split around aspect is visible, but I have also pointed out various places that need to be investigated in more detail. Finally, I discussed various alternatives and one problematic type of periphrasis for the approach put forward here, the passive. I argued that the passive might be a different type of construction than the other cases. This last point will also be discussed in the next chapter, where the passive behaves differently from all other valency changing morphology.

5

Auxiliaries cross-linguistically

So far the discussion of verb-word formation focused on phonological and syntactic tests to wordhood, and different sizes of words that could be built in different components, by looking in detail at Japanese and Turkish (Chapter 2); on how verb-words are built in detail, by focusing on the status of head movement in head final languages (chapter 3); and on various theories regarding auxiliary formation and correlations between periphrastic constructions and other syntactic phenomena (Chapter 4). The last part of the dissertation focuses on a different dimension of verb-word formation, namely the distribution of inflectional features. More specifically, the focus of this chapter is also on the synthetic-periphrastic alternation, but this is done by looking at the cross-linguistic distribution of voice, tense, aspect, and mood features on words. For example, in the

previous chapters I showed that Japanese and Turkish on the one hand have a synthetic verb form for simple tenses, but a periphrastic form for aspect-tense combinations, (1) for Japanese; Greek on the other hand have synthetic forms for tense aspect combinations, (2).

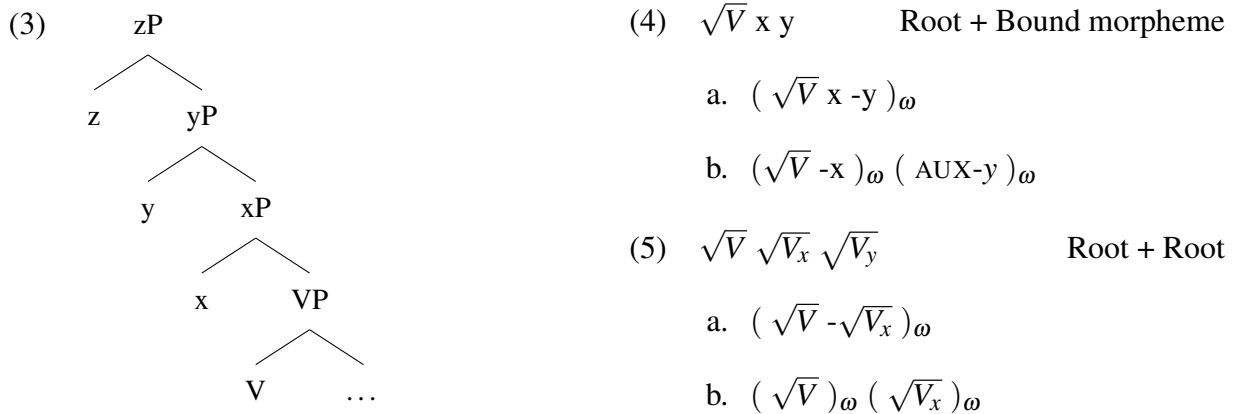
- (1) a. [hedatar -ru] [Japanese]
 be.distant -PRS
 ‘(it) is distant’
- b. [hedata -te] [i -ru]
 be.distant -ASP AUX -PRS
 ‘It is being distant’
- (2) [é -tro -a] [Greek]
 PST -eat.IPFV -1.SG.PST
 ‘I was eating / I used to eat’

Even though there is variation regarding word-hood and inflectional categories, the previous chapters explored various correlations between the languages in (1) and (2), namely the difference between movement before and after spell-out. Since Greek has a step of movement before the phase sends material to the interfaces, the verb ends up in a higher position, and can form a single syntactic unit with tense and aspect. Japanese and Turkish on the other hand, have a different timing for movement and always stops at the aspectual head.

Since the previous chapters mostly focused on a couple of languages, it is interesting to investigate a larger sample of data to establish the cross-linguistic variation regarding the variation of tense, mood, aspect, and voice features in synthetic and periphrastic constructions. In order to do this, this chapter focuses on a broad scale typological sample of 33 languages from 15 families and 3 isolates. Before returning to questions of head movement, and theories of periphrasis at the end of the chapter, the main focus will be on generalizations over these languages and generalizations over inflectional categories. After giving a background on the language sample and inflectional categories in Sec. 5.1, I turn to each type of inflectional category in Sec. 5.2. That is, I discuss synthetic and periphrastic patterns for voice, Sec. 5.2.1, aspect, Sec. 5.2.2, tense, Sec 5.2.3, and mood and modality, Sec. 5.2.4. This is done to establish for each of these categories and their subcategories if a particular feature is always expressed as an affix, is always expressed in a periphrastic constructions,

or can alternate (as is the case for the tense morpheme in Japanese for example).

In order to understand the patterns discussed in this chapter, it is important to be able to distinguish the building blocks, i.e. when periphrasis occurs between a root and an affix and between two roots. I assume that there is a lexical root with an extended projection (3) and the features in the extended projection (x, y, z) can be expressed as bound morphemes with requirements to be hosted, (4), or these features can be expressed with a free morpheme, or a different root (5).¹ For both options there can be a single unit option (4a, 5a), or two syntactic and phonological words, (4b, 5b).²



Thus, on the surface, the option for a single word or separate words for the root and the elements in the extended projection can look very similar. An example of the alternation in (4) where there is only a single verb, and the other elements in the extended projections are not roots is shown already in (1) for Japanese where the tense morpheme shows up as an affix when there is no overt aspectual marker, but needs to be hosted by a dummy auxiliary when aspect is an affix on the verb. In previous chapters I also have shown an instantiation of the second type of words where the features in the

¹For simplicity I refer to the element in the functional extended projection as a root, since these elements share properties with lexical roots in that they can stand on their own and can contribute meaning. These elements are, however, not necessarily the same, since ‘roots’ inserted in the extended projection of a lexical element tend to be a closed class, and are not, like most lexical elements an open class. They could also be called ‘semi-lexical elements’ (see for overviews Corver and van Riemsdijk 2001, Pots 2020). The exact status is not crucial here, but what is important is that they are elements that are more free in their distribution, and different from, bound morphemes.

²The ‘root-root’ option is an oversimplification of complementation structures, such as restructuring. I do not take a particular view on restructuring here, even though I represent roots as if they are inserted in the extended projection of a verb stem. This is done to focus on the type of morpheme that is used, but not on the specific structure. It could well be the case that the ‘root-root’ configurations involve VP-complementation structures.

extended projection can be expressed by roots, (5), namely with Japanese aspectual verbs, (32).

- (6) a. (L H H H H H H L)_ω
 he. da. ta. ri. ha. ji. me. ru.
 b. [[hedatar -i] -hajime -ru]
 get.distant -INF -begin -PRS
 ‘begin to become distant’

The aspectual marker *hajime* showed different behaviour to *te* in 1, both phonologically and syntactically: The pitch accent pattern in (1) ends on *te* in 1, whereas it includes the tense marker; morphologically *te* attaches to the verb stem, whereas *hajime* attaches to a verb that has additional morphology; syntactically the verbs with *hajime* behave as restructuring verbs, which the forms with *te* do not. I explained this different behaviour by assuming that *hajime* is a different element than *te*, i.e. a root instead of an instantiation of a bound morpheme, which might involve a different type of syntactic (complementation) structure. Thus, when identifying if a morpheme is an affix in the sense of (4a), or (5a) it is important to look for indications of different phonological, morphological and syntactic behaviour in the language sample.

This distinction is important in light of which feature combinations can and cannot combine inside a single word. That is, the reason for periphrasis in case of free (root) or bound morphemes can be different than for two roots. In case of the root-root combination, it is possible that the roots themselves do not have any requirements to be hosted by any material and can thus form two independent words, as if for example the case in the English equivalent of (32), where the main verb is expressed in an infinitival construction:

- (7) Lyra **begins to become distant** from Pantalaimon on the way to the Land of the Dead

This means that in case of root-root combinations it is not clear if the periphrastic construction comes from a requirement on the root, or a requirement of the features being (dis)allowed inside a single syntactic word. In case of the features being spelled out as functional heads that need hosts this is different. There are cases where a functional head is always spelled out as a separate morpheme, in case of speech act particles in Japanese for example, (8).

- (8) [nakunar -ru] yo ne
 renew -PRS SFP SFP

However, in other cases, as for example in (1) the periphrasis cannot be due to the requirements of the tense morpheme to be an independent word, since it always needs a host, and can even be hosted by the verb in single syntactic word. Thus, for these cases the reason for periphrasis is more likely to come from the combinations of features that can or cannot be combined inside a single syntactic word. However, in order to see the patterns where auxiliary formation comes as the result of features in the extended projection that cannot be combined, it is important to determine if a feature in the extended projection is expressed as a root or not.

After sorting out these different types of structures, the following picture arises. In the voice and vP domain, a split can be made between the passive and all other categories (causative, applicative, verbalizing heads, class markers). The latter can be marked via root-root combinations, i.e. the voice and valency changing heads can be expressed as a root themselves (such as *make* or *let* in English). In this case both the one word and two word options are found. However, when these markers are the expression of a bound morpheme that need a host, they are always marked affixal, and can be followed by any type of other category. That is, these morphemes, when they are the expression of a bound morpheme never participate in periphrasis, with a dummy-auxiliary. The only exception to this pattern is the passive, which can be expressed in a periphrastic (participial) construction. Based on the discussion in Ch. 4, I show why this might be an exception.

In the aspectual domain, lexical aspect (ingressive, terminative, repetitive etc.) has the same pattern as most voice and valency changing morphology: when the category is expressed via a root it can be periphrastic or not; but when it is expressed as a bound morpheme it is always expressed as an affix and can be followed by any type of category. Thus both most valency changing morphology and lexical aspect functional morphology never participates in periphrasis. Viewpoint aspect (imperfective, progressive etc.) on the other hand is mostly expressed affixally, and not via a root. Differently from the other categories discussed so far, it is more often the end of the verb-word and can not be followed by most other categories. Thus there are more languages that are similar to Japanese/Turkish than Greek in the sample. Interestingly, there are no splits within

more fine-grained distinctions. In other words, it is not the case that a language expresses a subset of viewpoint aspect morphology as synthetic and another subset as periphrastic. The final aspectual category, the Perfect, is quite different: when it is expressed as an affix there are various restrictions on which morphemes it can combine with, and most often when it is expressed periphrastically there is no dedicated perfect morpheme, but there is a different distribution of tense and aspect morphology. I argue that this follows from a different position in the clause, following literature that argues that this is a different head between tense and viewpoint aspect.

Within the tense domain a difference can be seen between past/present and the future with regard to their morphological reflexes. Past/present morphology is the most alternating category, as in the example for Japanese in (1): it can be expressed synthetically, but in most languages not when it is combined by viewpoint aspect. Future on the other hand is most often expressed periphrastically, either as a root or as a functional morpheme. In those languages that it is not, there are various other restrictions visible, and many of those languages in fact lack present/past morphology. The mood and modality categories are discussed the least in this chapter, because these two categories constitute a complex group of features (cf. Palmer 2001). Since I am only working with grammars at this point, it is not possible to determine on a fine-grained level what the actual categories are.

These findings are summarized as follows. All types of lexical aspect, all types of valency changing morphology (except passive) when they are expressed as bound morphemes never participate in periphrasis in any way. These categories can participate in periphrasis in languages where these categories are expressed as roots, and participate in different types of complementation structures, such as restructuring. However, there are no cases where there are entities of the form ‘*Verb be-semelfactive*’. All other categories do in some form or another participate in bound-morpheme periphrasis, where either the category is periphrastic itself (tense, mood), or cannot combine with other morphology following it (viewpoint aspect). Moreover, overwhelmingly, features in a particular category behave the same way in a given language: when a language makes three overt distinctions for valency changing morphology it is not the case that two behave in one way whereas

the other behaves differently. The same holds for viewpoint aspect and lexical aspect.³ These two generalizations are given in (9).

(9) a. *Generalization I*

When *v*, Valency changing morphology, and Lexical aspect are expressed as bound morphemes, they do not participate in periphrasis

b. *Generalization II*

All features expressed as functional morphemes in a single category in a given language behave the same with regard to periphrasis

These generalizations are interesting, since it could have been the case that specific features being expressed as a bound morpheme behave in one way, whereas others being also expressed as bound morphemes behave differently, and that every category participates in periphrasis in some way. These findings fit with the domain approach to word building that is put forward in this dissertation where all features in the first domain always combine, and only the features at the edge (viewpoint aspect) participate in periphrasis.

The remainder of the chapter first discusses the methodology, Sec. 5.1, focusing on the collection of the data and the details of the language sample, and the introduction of the various inflectional categories and how each of the categories are classified in the languages. After this, in Sec. 5.2 I discuss the details of the combinations for inflectional features and the various generalizations that arise. Finally, Sec. 5.3 returns back to the theoretical questions in this dissertation and how the findings of this chapter bear on the various theories of periphrasis and head movement etc.

5.1 Methodology

This section focuses on two issues related to conducting typological research . The first part is to establish the rationale for the language sample, and the data for each language in the sample, Sec. 5.1.1. The second part focuses on how the morphemes in each language are classified, Sec. 5.1.2.

³Evenki presents a possible challenge, which will be discussed in section 5.2.2.2 in more detail.

That is, in order to see if it is possible to make generalizations regarding specific or more general features, it is important to first look in detail at the meaning of the morphemes. This will be used when the categories are discussed in section 5.2.

5.1.1 Data Collection

In order to investigate the limits of auxiliary formation, I look at the tense, mood and aspect paradigms of languages with a large inventory of suffixes for these categories and compare this with languages that mostly express these categories with the use of auxiliaries. This section explains the considerations for the languages in the sample, and how the morphemes in the languages have been labeled. The language sample, consisting of 33 languages from 15 families, and 3 isolates is presented in table 5.1 and the classification is based on WALS.

Macroarea	Family	Genus	Language	References		
Africa	Niger-Congo	Bantoid	Kinande	Bjorkman (2011)		
			Ndebele	Khumalo (2007), Pietraszko (2017)		
			Shona	Mberi (2002), Aranovich (2015)		
Eurasia	Altaic	Turkic	North Azeri	Davis (2014, 2018)		
			Turkish	Kornfilt (1996, 1997), Cinque (2001) Zanon (2014), Fenger (2019)		
	Austro-Asiatic	Aslian	Semelai	Evenki	Nedjalkov (1997) Bulatova and Grenoble (1999)	
				Basque	Kruspe (2004) Arregi (2000), Bjorkman (2011) Hualde and de Urbina (2003) Arregi and Nevins (2012)	
	Dravidian	S. Dravidian	Malayalam	Asher and Kumari (1997) Swenson (2017)		
	Eskimo-Aleut	Indo-European	Eskimo	Kalaallisut	Fortescue (1984)	
				Albanian	Newmark et al. (1982), Camaj (1984)	
				Armenian	Armenian E Sakayan (2007), Dum-Tragut (2009)	
				Germanic	English	
				Hellenic	Greek	Sofroniou (1962)
				Indo-Aryan	Hindi	Masica (1993), Bhatt and Embick (2003)
				Romance	Latin	Ackema (1995), Embick (2000) Kiparsky (2005) Bjorkman (2011), Calabrese (2019)
	Japanese	Japanese	Japanese	Italian		
				Japanese	McCawley (1968), Inoue (1969) Sugioka (1984), Sawada (2007)	
				Archi	Kibrik (1977), Chumakina (2013)	
Nakh-Daghestanian	Lezxic	Archi	Nivkh	Gruzdeva (1998)		
			Nivkh			
Sino-Tibetan	Mahakiranti	Mahakiranti	Kham	Watters (2002)		
			Newar	Genetti (2007)		
Uralic	Finnic	Finnic	Finnish	Dahl (1985), Karlsson (1999) White (2006), Bjorkman (2011)		
N. America	Penutian	Sahaptian	Nez Perce	Crook (1999)		
Papunesia	Austronesian	Sinaugoro	Sahaptin	Jansen (2010)		
			Solomons East Papuan	Balawaia	Kolia (1975)	
			Trans-New Guinea	Lavukaleve	Lavukaleve	Terrill (2003)
				Finisterre-Huon	Selepet	McElhanon (1972)
			Yareban	Koriarian	Barai	Olson (1975)
					Ömie	Austing and Upia (1975)
S. America	Moesetén	Moesetén	Yareba	Weimer (1972) Weimer and Weimer (1975)		
			Urarina	Urarina	Sakel (1973) Olawsky (2006)	

Table 5.1: List of languages

Some notes on the language sample are in order. First, the sample consists of 33 languages from 15 families and 3 isolates. This is done to ensure that the results of when and where auxiliaries occur are not just a within family effect, nor an across family effect. This way, it is easier to control for the reasons for the limits on variation. That is, if the same variation is found in a single family and across families, it is likely to be an effect of an underlying reason and not just a genetic effect.

Second, it is important to include languages that have been described as different ‘types’, i.e., languages that mostly use auxiliaries and languages that mostly use affixation to express inflectional material in order to see how different they are. Especially, in order to see how many inflectional categories can end up on the verb, it is important to look at languages that have been described to be synthetic, and, more precisely, as having tense and aspect inside a single verb. The languages discussed here are a combination of descriptions in the literature, most importantly discussed in the surveys by Cinque (1999) and Julien (2002). The sample includes a subset of languages described in their work as having tense and aspect inside a single word. Importantly, the survey here also includes languages that are described as having mostly auxiliaries. This way the two ‘types’ of languages (synthetic or not) can be compared. Finally, the survey includes those languages that have been discussed in the literature on auxiliary formation (Ackema 1995, Embick 2000, Kiparsky 2005, Bjorkman 2011, Aranovich 2015, Pietraszko 2017, Davis 2018, Fenger 2019), and have been put together here to see similarities and differences, and are complemented with various other languages from different families.

Third, even though this is the first typological study on auxiliary formation by looking at the categories expressed on the verb and the auxiliary, it is not the first on the expression of tense, mood and aspect. My sample has some overlap with the languages discussed in two other typological works on TMA systems, namely those of Bybee (1985), Dahl (1985), their follow up work in Bybee and Dahl (1989), and Bybee et al. (1994). Even though their focus was slightly different, and they didn’t look at specific combinations of tense and aspect (or combinations of different categories) several observations made in their studies and mine are the same (specifically regarding the expression of the categories progressive and perfect) and will be discussed later on.

Before turning to the generalizations, it is important to discuss the labels used for the morphemes in this study, to see how specific morphemes are classified in the language sample.

5.1.2 Working definitions for Inflectional categories

This section focuses on the labeling of the morphemes discussed in the languages based on the literature. Since descriptions for different families can differ based on specific research traditions it is important to find a more unified description, wherever possible. This is done by looking at the contexts in which the morphemes are expressed. The following subsections focus on working definitions for tense, mood and aspect, based on previous typological works (Bybee 1985, Dahl 1985, Bybee and Dahl 1989, Bybee et al. 1994) and complemented with in depth work on the particular categories (Comrie 1976, 1985, Klein 1994, Palmer 2001, Deo 2020, a.o.). I am not assuming that all the labels are supposed to be the final analyses for all the languages in the sample, and that in some cases more fine-grained analyses are possible. For example, I distinguish between labels such as progressive, habitual, and imperfective, since this gives sufficient detail for the study, even though various other flavors of imperfectivity might be available (Arregui et al. 2014, Deo 2020, a.o.). Whenever needed, a discussion of more detailed analysis will be provided.

Since this part of the dissertation is concerned with the actual building blocks of the verbs and auxiliaries, several other notes about labeling are in order. I would like to point out here that much of the previous literature had a different focus than I have here, and therefore didn't necessarily need to look at the precise classification of a morpheme as tense, mood or aspect. The labels in this dissertation are therefore not always the same as the labels used in the grammars or literature on the languages. The decision for a particular label is based on the usage of the morpheme in context with other morphemes, adverbs, and other available contexts, if available in the grammars. In some cases more in depth research was done on the particular morphemes in a specific languages, and I based my decision on those findings.⁴

⁴For example, in his work on the clausal spine, Cinque (1999), has an example of Evenki (part of the sample in this work too) where a morpheme corresponding to Aspect and a morpheme corresponding to Tense occur inside a single word. However, based on the complete tense system of Evenki in different sources, this particular tense morpheme is in

As Dahl (1985) also points out, most languages can distinguish all the different types of readings of different readings of aspect, tense or modality, but that does not mean it is necessarily grammatically marked. By this he means that there is a designated morpheme that is used to express a particular meaning. There are other ways to mark a reading, for example with adverbs or a prepositional construction. For this chapter I only focus on cases of grammatically marked meaning, i.e., morphemes expressing a certain meaning. I will point out when it is not clear if we are dealing with a grammatical-marker, or a meaning that is expressed with a different type of construction. I will discuss in various places morphemes that seem to be part of a gray area (not grammatically marked, nor clear instances of contextual meaning), for example with regard to progressive marking and bi-clausal structures

5.1.2.1 Voice, *v*, and valency changing morphology

The discussion in this section is focused on features that are traditionally associated with the verb phrase, such as verbalizing morphology and valency changing morphology. For the discussion at hand, I assume that there can be various heads in this domain, that is, I assume some version of a split-verb phrase hypothesis (Larson 1988, Johnson 1991, Bowers 1993) where verbalizing morphology is introduced by a different head than valency changing categories (Hale and Keyser 1993, Kratzer 1994, 1996, Chomsky 1995, Marantz 1997, Pylkkänen 2002, 2008, Ramchand 2008, D'Alessandro et al. 2017), and discuss various properties and distinctions in two different subsections.

5.1.2.1.1 Verbalizing features I take verbalizing features, and morphemes, to include markers that express declension classes or what is labeled as derivational morphology to indicate that a complement of that morpheme is turned into a verb. In many cases these could be labeled as ornamental morphology on the verb, such as class-markers in certain languages, or theme vowels in others. This type of morphology generally does not contribute any meaning to the verb, other than identifying a certain class of verbs, or the fact that certain stems are used as verbs in this fact more likely to be an aspectual marker (Bulatova and Grenoble 1999).

specific context. For example, Yareba verbs always require a class marker depending on a specific classification of verbs, (10). In this language a verb always requires a specific marking depending on a group of verbs.

- (10) a. i -t -a -su [Yareba]
eat -CLASS.I -PRS -3.SG
'He is eating'
- b. mu -n -i -nu
take -CLASS.II -NEAR.PST -3.SG
'he took'
- c. e -r -a -su
see -CLASS.III -PRS -3.SG
'he is seeing' (Weimer 1972, p.60)

5.1.2.1.2 Valency changing features There are various markers that can express the addition, deletion, or promotion of certain arguments. These are sometimes discussed as various flavours of *v* (REF) or as part of voice morphology (see overview in D'Alessandro et al. 2017). Examples of valency-increasing operations include the applicative (11) and causative (12).

- (11) [Ngi- phək -el -a] abantwana [Ndebele]
1.SG cook -APPL -FV 2child
'I cook for children' (A. Pietraszko, p.c.)
- (12) Lyra **makes** her Daemon Pantalaimon sleep on her shoulder [English]

In case of the applicative, the oblique argument is promoted to a direct object position. That is, an internal argument gets promoted to a different internal argument position. In case of the causative a new argument is introduced in the clause (the causer). There are various differences in what type of causatives exist (Dixon 1994, a.o.).

Valency demotion operations include passives and anti-passives, middles, reciprocals and reflexives. In all of these cases a verb that is generally considered transitive is used in an intransitive context. For example, with the reciprocal and reflexive in (13) in Sahaptin, the verb only references a single person or group and the agent and the patient are co-referenced.

- (13) a. áswan [**piná-** ílamayk -sha] [Sahaptin]
 boy REFL- hide -IPFV
 ‘The boy is hiding himself’
- b. [**pápa-** wyák’uk -xa]
 RECIP- gather -PST
 ‘They gather together’ (Jansen 2010, p. 320)

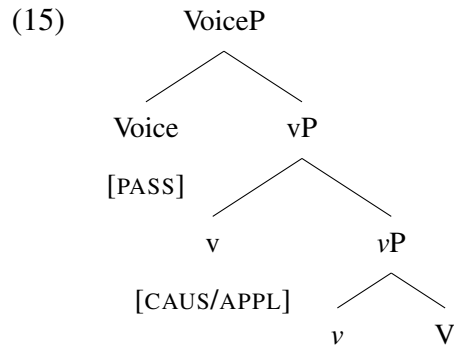
Passives are defined by a more complex set of properties. An example is given in (14) for Dutch. The examples show the following properties: the external argument is demoted, and expressed in the by-phrase; the internal argument *Bassie en Adriaan* is promoted to be a subject, and the verb is in a participial construction with an auxiliary.

- (14) a. B100 **achtervolgt** Bassie en Adriaan [Active]
 B100 pursues Bassie and Adriaan
 ‘B100 is pursuing Bassie and Adriaan’
- b. Bassie en Adriaan **worden achtervolg-d** door B100 [Passive]
 Bassie and adriaan are follow-PART by B100
 ‘Bassie and Adrian are followed by B100’

These three properties are not always present in all languages, which has made it hard to find a unifying description cross-linguistically (Perlmutter 1978, Perlmutter and Postal 1983, a.o.). However, in most cases there is a change from a transitive to an intransitive construction, and the internal argument gets promoted (Perlmutter and Postal 1983, Dixon 1994, a.o.). Thus, even though there is a demotion part to the passive, there is, similar to applicatives, also a promotion of an argument.

5.1.2.1.3 summary of v and voice In the literature (overview in D’Alessandro et al. 2017) there seems to be a growing body of work that argues that the elements discussed above can be in structurally different positions in the clause, (15). In this literature passives, being a type of voice, are structurally higher than other valency changing operations (Collins 2005, Bruening 2013, Alexiadou and Doron 2012, Alexiadou et al. 2015) ; and class marking is even lower, on a verbalizing head. Note that I do not necessarily assume that all these heads are present as distinct heads in each language, it might be the case that in some languages several of these heads are bundled (Harley

2017). However, what will be important for the remainder, is that in most types of analyses the passive is in fact the highest category. Crucially, it is exactly this category that has very different morphological reflexes in terms of synthetic-periphrastic alternations from all the other categories.



5.1.2.2 Aspect

In general, the overarching category of aspect makes explicit how a specific event takes place (as ongoing or as finished), and how the event is perceived. There are two major types distinguished in the literature, which I will refer to as viewpoint aspect and lexical aspect. Since the Perfect is generally discussed as a type of aspect, since it shares various properties with (im)perfectivity, and is at the same time different in various ways. it is discussed as a separate category.

5.1.2.2.1 Viewpoint Aspect This type of aspect deals most clearly with how the event is looked at. Smith (1991) describes this type of aspect as the use of a camera lense, to focus on a particular part of the event. The most general distinction that can be made is between perfective (PFV) and imperfective (IPFV). Generally speaking, PFV aspect looks at the event as a whole, without ‘explicit reference to the temporal constituency of a situation’ (Comrie 1976, 21). This is in opposite to the IPFV, which generally describes the situation as continuing through some internal subpart of time (Comrie 1976, Smith 1991, Klein 1994, Kratzer 1998, Deo 2020, a.o). Examples are given in (16-17) for Basque, since it has dedicated morphemes for both values. The abstract structures in (16b-17b) show how the different types of aspect conceptualize the event.

(16) Perfective

- a. emakume-a-k ogi-ak ja-n d-it-u [Basque]
 woman-DET-ERG bread-DET.PL eat-PFV 3.ABS-PL.-have.3.ERG
 ‘The woman has eaten (the) breads’ (Laka 2006, 177)

b.

Aspect	[]
Event	////////////////

(17) Imperfective

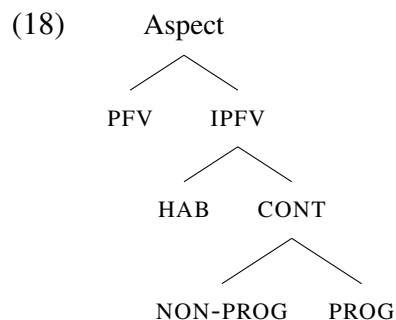
- a. emakume-a-k ogi-ak ja-ten d-it-u
 woman-DET-ERG bread-DET.PL eat-IPFV 3.ABS-PL.-have.3.ERG
 ‘The woman eats (the) breads’ (Laka 2006, 177)

b.

Aspect	[]
Event	////////////////

Crucially, the PFV does not look at the internal structure of the event, and does not say anything about the length of the event. The PFV can refer to a short period, but does not have to, and can be used with time frames that are also used for the IPFV. This is different, as we will see below, from lexical aspectual morphemes, such as *punctual*.

Turning to the IPFV, there are various flavours of IPFV and languages differ on how many distinctions can be made in the morphology. Most notable, there is a difference between progressive (PROG) and habitual or generic (HAB) readings. The distinctions can be summarized in the following figure, based on Comrie (1976).



The HAB is generally characterized as describing a situation that extends over a longer period of time, and is not an accident of a particular moment, as shown in (19) for the sun in Evenki (Tungusic). The second, PROG is generally used to denote ongoing situations, as shown in example

(20) from Chol (Mayan). When a language has a PROG and another IPFV marker, as is the case in Mayan, the non-PROG marker cannot be used in the same context as the PROG.

- (19) Dylacha du:nne-le garpa-d'a-**vki** (bi-si-n) [Evenki]
 sun earth-all shine-IPFV-HAB.PART be-PRS-3.SG
 'The sun shines above the earth.'/ 'The sun's rays fall on the earth' (Nedjalkov 1997, p.236)
- (20) **Choñkol** i-ch'il ja'as aj-Doris cheñak tyi k'oty-i-yoñ [Chol]
 PROG 3-fry banana DET-Doris when PFV arrive.there-INTRANS-1
 'Doris was frying bananas when I arrived' Based on (Coon 2010, p.42)

I would like to point out that these are only three major categories of IPFV. However, what is called IPFV in one language might be different from the next (Comrie 1976, Dahl 1985, Arregui et al. 2014, Deo 2020). For now I will not distinguish between these different flavours, because it requires more in depth research for each language. It would not be unexpected that differences in the building blocks lead to differences in the syntax and morphology, but it will not be possible to discuss this here. What is important is that the markers identified as viewpoint aspect have viewpoint aspect as their core meaning and not tense or lexical aspect.

Finally, a third type of aspect is discussed in this area, which is that of prospective aspect (PROSP). This can be seen as the aspect that is used for the future. In this case a present state can refer to a future event, but there is no implication of the future actually turning out that way (Comrie 1976). In English this can be illustrated with the difference between *to be going to*, and *will* (Comrie 1976). An example for both is given in (22).

- (21) Prospective
 Aspect | []
 Event | ////////////////
- (22) a. Lyra is going to visit the Land of the Dead.
 b. Lyra will visit the Land of the Dead.

According to Comrie there is a subtle difference between the two with regard to the implication of an imminent future event. When one of the two sentences is uttered, and Lyra is after this prevented from visiting the Land of the Dead, the speaker uttering (22b) would be wrong, since the

prediction is not borne out. However, if a speaker were to utter (22a), the utterance is not necessarily wrong because she would allude to the intention of Lyra to visit the Land of the Dead, and not to the immediate future time. As Comrie also points out, there are many subtle differences that are not easily translatable. However, in this case it means that *will* carries future time reference, whereas *going to* does not and can be interpreted as prospective aspect. As should be clear at this point, this is a very subtle difference, which is not easy to detect in languages. As will become clear in the discussion below, only a few languages are listed as having a grammaticalized prospective aspect marker. This might be because these languages have been investigated in more detail, and it could be the case that some of the markers that are marked as future are in fact aspectual. This will be pointed out in the discussion below.

5.1.2.2.2 Lexical Aspect This type of aspect is different from viewpoint aspect in that it has to do with a property of an individual predicate and gives further information about the type of event. Apart from notions like telicity and stative/eventive predicates, there are many labels that are used in descriptions that are closely related to viewpoint aspect such as durativity, pluractionality, iterativity and punctuality and are sometimes conflated with IPFV and PFV. Comrie (1976, 41), notes for example about the difference between durativity and imperfectivity that ‘imperfectivity means viewing a situation with regard to its internal structure (duration, phasal sequences), and durativity simply refers to the fact that the given situation lasts for a certain period of time’. As an example he gives the Russian verb *postojal*, which is the PFV form of stand, but it can be used to refer to a certain period of time, such as ‘stood there for an hour’: the whole event is looked at as a whole, but the event can be durative.⁵ The opposite of durativity is a punctual situation which only lasts for a single moment, and as such does not have any internal structure. This meaning can thus be confused with PFV, since both do not refer to the internal structure of the event. However, as pointed out above, the PFV can last longer than a single moment. Moreover, true IPFV and PFV meanings should be in complementary distribution and cannot be combined in a single (mono-clausal) utterance since they refer to opposing semantic values. This then can be taken as a test to see if a language

⁵See for a recent overview Henderson (2017) and tests to distinguish between lexical and viewpoint aspect.

has markers that are viewpoint aspect or lexical aspect.

5.1.2.2.3 Perfect I have singled out the Perfect (PRF), because it is quite often used interchangeably with PFV marking. In the literature, this category is sometimes treated as a type of viewpoint aspect (Reichenbach 1947, Klein 1994, a.o), sometimes as a lexical aspect, (Parson 1990, Kamp and Reyle 1993, Giorgi and Pianesi 1997), and sometimes as a relative tense (Iatridou et al. 2003, Pancheva 2003, Pancheva and von Stechow 2004, Rothstein 2008). When discussing the data below, I will also treat the perfect (PRF) as a separate category, in line with (Comrie 1976, Dahl 1985, Iatridou et al. 2003, Pancheva 2003, Pancheva and von Stechow 2004, Rothstein 2008). This is mostly based on the fact that in many languages, like English, it is possible to distinguish Perfect from viewpoint aspect and tense, and the perfect not in complementary distribution with aspect. That is, it is not possible to have both PFV and IPFV morphology in the same sentence, but it is possible for either PFV or IPFV to combine with PRF marking. The following sentences show how the Perfect can combine with three tenses (present, future, and past) and two aspects (perfective and progressive) in English.

- | | |
|--------------------------------------|-------------------------------|
| (23) | [English (Swenson 2017, p50)] |
| a. I have visited the Met | [Present Perfect Perfective] |
| b. I will have visited the Met | [Future Perfect Perfective] |
| c. I had visited the Met | [Past Perfect Perfective] |
| d. I have been visiting the Met | [Present Perfect Progressive] |
| e. I will have been visiting the Met | [Future Perfect Progressive] |
| f. I had been visiting the Met | [Past Perfect Progressive] |

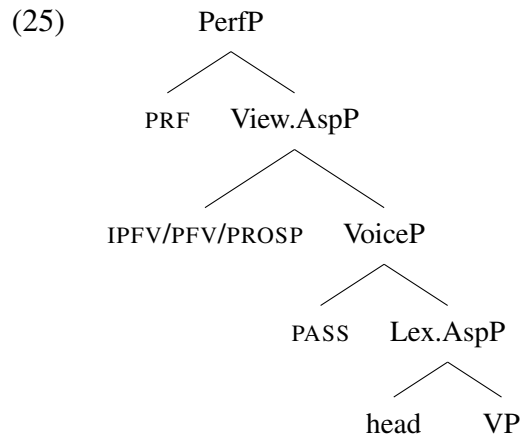
In the literature a lot of the time PFV and PRF are used interchangeably, but there are clear distinctions between the two. The Perfect itself does not say anything about the situation itself, as is the case with PFV/IPFV, but it relates a state to a preceding event. As Comrie describes it: ‘the

perfect indicates the continuing present relevance of a past situation' (Comrie 1976, p52), illustrated in (24).

(24) Perfect

Perfect	[]
Event	////////////////

5.1.2.2.4 Summary of aspect I assume the following hierarchical structure for the categories discussed so far, (25). This structure is based on ideas in the literature where groups of features are organized into fields (Giorgi and Pianesi 1997, Schifano 2015). It could be the case that a more full fledged structure is needed, as for example has been discussed in (Cinque 1999) where each feature is expressed in a different head. However, for the purposes of the data discussed below this amount of structure will be sufficient. Second, note that I do not necessarily assume that all heads should be available in every utterance and that not every language distinguishes all of the categories. This structure is to represent various fields of categories, since this is what will be visible in the data below. However,



When looking at the languages in the sample, as much as possible I use observations available in the grammars and additional literature to determine what type of aspect is being used. However, in some cases it will not be possible to distinguish if a label is in fact viewpoint aspect or lexical aspect, since labels are used interchangeably. If this is the case, I will note it.

5.1.2.3 Tense

Tense is used to encode the relationship between the time a sentence is uttered and the event (Reichenbach 1947, Comrie 1985, Kamp and Reyle 1993, Klein 1994, Smith 2007). That is, the past tense refers to the event having taken place before the utterance time, whereas present tense refers to the utterance time and the event being at the same moment. Thus there is a similarity and a difference between tense and aspect. Tense is different from aspect in that Tense does not say anything about how the event is viewed, it only places the event in a space in time. They are similar, in that both refer to the event, but do so in a different way. As shown for Past tense in English in (26), the utterance time can refer to the event [*eat dutch cheese*]⁶, which can be looked at as a whole (PFV), or as ongoing (PROG). For the present, the utterance time and the event are the same.

(26) Past Tense

a. Imperfective: *I was eating Dutch Cheese*

Tense		X
Aspect	[]	
Event	//////////	

b. Perfective: *I ate Dutch Cheese*

Tense		X
Aspect	[]	
Event	//////////	

As will become clear in the sample below, languages differ in how they use tense. Many languages make a distinction between past and present, but there are languages that make further distinctions, such as a difference between recent and distant past, and use so-called relative tenses (Comrie 1985). For the dissertation the amount of types of tenses is not that important in a language, it is important to know if what is labeled as tense is tense, or in fact a subcategory of aspect or modality. I do not take future to be a tense, but rather a modal, in line with previous research (Abusch 1985, Copley 2002, 2009, Matthewson 2006). Again, note of caution that in some cases

⁶The best cheese, for obvious reasons.

something is labeled as aspect is in fact tense, or vice versa. If it is not possible to determine what the actual analysis should be, I will point this out. As will become clear, there might be cases that look like counterexamples but more research is needed and I will point out several directions.

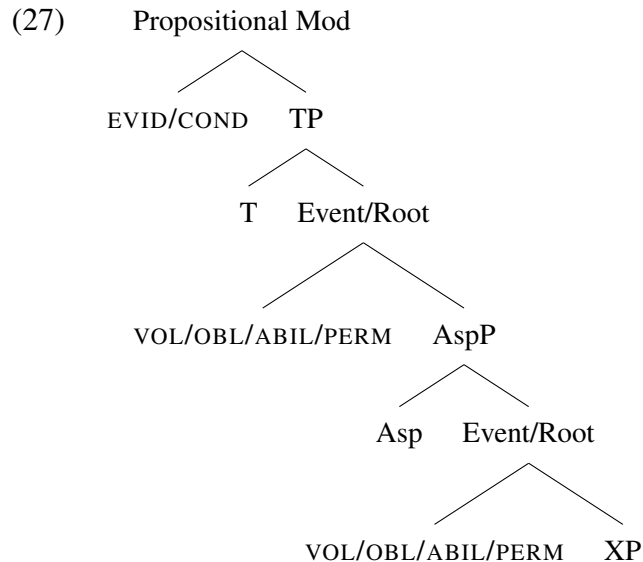
5.1.2.4 Mood and Modality

For the purpose of this dissertation I treat the categories of Mood and Modality together (following the overview in Palmer 2001), recognizing that there is a considerable amount of variation and that languages can differ on being a mostly Mood-type or Modality-type language. Overall, Mood and Modality deal with how the proposition that describes the event is evaluated. This makes it different from Tense and Aspect in that it does not deal with any specific detail of the event.

There are several ways a language can deal with the larger category of modality and the overarching category is generally split up in Mood and Modality. Both can occur in a single language, but they don't have to. Mood has to do with categories such as subjunctive, indicative and imperative, or in other language-families, realis and irrealis.

Modality, as distinct from Mood, on the other hand can be divided in Propositional modality and Event Modality (using Palmer's labels). As Palmer (2001) points out, there is probably more variation with the grammatical category of modality than that there is variation within tense and aspect. Again, for Propositional modality, languages can differ what type of system they make use of: there are epistemic and evidential systems. The former type of system focuses on the judgement of the speaker on the factual status of a proposition, whereas in the latter system the focus is on the evidence for the status of a proposition. Crucially, as is the case for various types of aspect, modality seems to also be able to be split up in different parts of the hierarchical structure (Cinque 1999, Hacquard 2010, a.o.). Propositional modality is generally high in the clause, even higher than Tense. Event (or in some sources called Root) Modality on the other hand consists of a mixed group of categories and languages differ where in the clause this is expressed: in some languages some of the categories can be expressed below aspect, and in others it is above aspect (and/or tense). This type of modality has to do with categories such as as volition, obligation, ability and permission.

This is represented in the following structure.



5.1.3 Summary and what is to come

Overall, the discussion makes a distinction between different fields, and categories that belong to a specific field. A summary of the features and fields discussed in this section are summarized in table 5.2. The top row constitutes those features that according to the literature have been described as closest to the verb stem, whereas the last row (mood) includes features that are generally more peripheral on the verb. This translates into a hierarchical structure where *v* is lowest in the clause structure, and mood high.

Field	Category
<i>v</i>	class, theme vowels, verbalizers
valency changing	CAUS, APPL, BENEF, INCH, MIDDLE, RECIP, REFL., AP
Lexical Aspect	INGRESS, INCEPT, PUNCT, SEMELF, REP, CONT, RES. TERM.
Voice	PASS, ACT
Viewpoint Aspect	IMPF, PFV, HAB, PROG, CONT PROSP
Event Modality	ABIL, NEC, OBL, VOL, PERM
Perfect	PRF
Tense	PST, PRES, FUT
Propositional Modality	EVID, COND
Mood	IMP, SUBJ, INDIC, IRR

Table 5.2: Overview fields and categories

When discussing the patterns from the languages in the sample, I show that auxiliary patterns arise based on the field, and not on the specific category. That is, I provide overviews of the variation of the various categories in a specific field for all the languages, and show that whether there is a periphrastic construction or not, it does not depend on a subset of the categories in a single field, but all categories behave the same. For example, when a language has separate imperfective, perfective, habitual and progressive marking all of these categories in Viewpoint Aspect behave the same when it comes to having other categories following them or not. Thus, it is not the case that the imperfective leads to periphrasis, whereas the perfective does not.

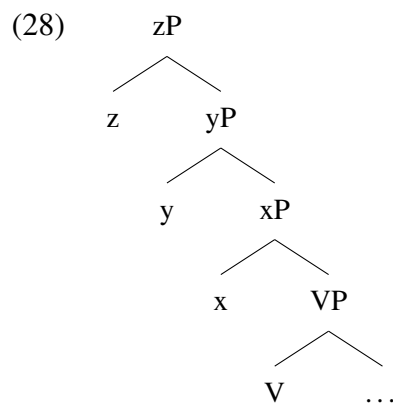
5.2 Data patterns

With this in mind we can turn to the data. This section is set up in the following way. Just as in the previous section where each of the categories are explained, I go over Voice, Aspect, Tense, and Modality in the subsections. I discuss for each of the categories the language variation regarding how the features are expressed: as affix, clitic, or independent element. This means first of all, looking at the combination of the verb and the particular category. However, as discussed in previous chapters, and previous literature, there are various cases where the feature can be expressed in a variable way, depending on the surrounding features. To this end, it is also important to see the category in context with other features. The only category that will not be discussed in as much detail is Modality and Mood, since, as pointed out, is such a complex category which is generally not reflected in the grammars. I will only note small observations and leave researching these categories for future work,

Thus, each section will first provide a table to classify languages with regard to a feature being (i) always expressed as an affix, (ii) never expressed as an affix, (iii) sometimes expressed as an affix, or (iv) the language does not grammatically express this category. This a rough first division for each of the categories, since each of the categories might consist of a mixed group of languages. Second, I look at, when it is an affix if it can be followed by other morphemes. For all categories this

is important. For example, it does not mean that if a feature is always expressed as an affix it can be combined with any other type of marker: there might be restrictions on which aspectual values can be expressed in a certain modality. Even though it is important to look at the generalizations on the level of each field, and each category, it will also be important to see these generalizations put together with other categories.

The following picture arises with regard to synthesis-periphrasis, and with regard to the type of auxiliary pattern. First of all, languages make a distinction for various categories if these categories in the extended projection can be expressed as a bound morpheme or as a root. The different options are repeated from the introduction in (28-30). For both type of morphemes, it is theoretically possible to find them in a single syntactic unit with the verb root, or in a periphrastic construction.



(29) $\sqrt{V} x y$ Root + Bound morpheme

a. $(\sqrt{V} x -y)_\omega$

b. $(\sqrt{V} -x)_\omega (AUX-y)_\omega$

(30) $\sqrt{V} \sqrt{V_x} \sqrt{V_y}$ Root + Root

a. $(\sqrt{V} -\sqrt{V_x})_\omega$

b. $(\sqrt{V})_\omega (\sqrt{V_x})_\omega$

An example of the different types of forms are given in the following examples. The alternation for an affix that is expressed on the verb or on an auxiliary is presented in (31). The different instances of a root are presented for the element *begin* in both English and Japanese. As shown in Ch. 2, *hajime* is a root even though it can be a word with the verb, as was discussed for coordination patterns.

(31) a. Lyra [showed-**ed**] Pantalaimon a secret

b. lyra [ha-**d**] [shown] Pantalaimon a secret

- (32) a. (L H H H H H H L)_ω
 he. da. ta. ri. ha. ji. me. ru.
 b. [[hedatar -i] -hajime -ru]
 get.distant -INF -begin -PRS
 ‘begin to become distant’

- (33) Lyra **begins to become distant** from Pantalaimon on the way to the Land of the Dead

This means that the expression of inflectional material as roots (30) could lead to compounding-like structures, or they can be periphrastic. In case of these type of periphrastic constructions, the periphrasis can be due to the status of the feature being expressed as a root, i.e. a lexical item, and as such can be a free standing element. These type of structures are found for lexical aspect, modal verbs, and causative in the sample below. This is in line with findings in the literature as well (Givón 1980, Wurmbrand 2001, 2015, Wurmbrand and Lohninger 2019). The expression of features in the extended projection as bound morphemes has different results. Moreover, in this case, a periphrastic expression cannot be due solely to the status of the morpheme itself, since this can be expressed in most cases on the verb-root. Crucially, only in the context of other features does a particular feature get expressed as a periphrastic construction, and needs to be hosted by a dummy auxiliary.

After sorting out these different types of structures, the following picture emerges for the type of auxiliary patterns where there is only a single root, and the features in the extended projection are expressed as affixal material. All verbalizing and valency changing morphology (except passive) and all lexical aspect is always expressed affixally, and can be combined by most other categories. That is, these categories never participate in periphrasis in any way: the features themselves are not hosted by dummy auxiliaries, nor are other features expressed with a dummy auxiliary because of these categories. Moreover, this generalization can be made over all categories available in a particular language: it is not the case that if the language makes use of applicative, middle and causative marking that a subset of this marking participates in periphrasis, whereas the others do not. Thus, abstractly, the following patterns are attested and not attested for the features in Table 5.2, for lexical aspect and v and valency changing morphology. That is, there are no instances of dummy auxiliaries that host any of these categories.

- (34) *v*
- a. Attested: V-*v*; V-CLASS; V-TH.V
 - b. Unattested: AUX-*v*; AUX-CLASS; AUX-TH.V
- (35) Valency Changing
- a. Attested: V-CAUS; V-APPL; V-BENEF; V-INCH; V-MIDDLE; V-RECIP; V-REFL; V-APASS
 - b. Unattested: AUX-CAUS; AUX-APPL; AUX-BENEF; AUX-INCH; AUX-MIDDLE; AUX-RECIP; AUX-REFL; AUX-APASS
- (36) Lexical Aspect
- a. Attested V-INGRESS; V-INCEPT; V-PUNCT; V-SEMELF; V-REP; V-CONT; V-RES; V-TERM
 - b. Unattested AUX-INGRESS; AUX-INCEPT; AUX-PUNCT; AUX-SEMELF; AUX-REP; AUX-CONT; AUX-RES; AUX-TERM

For passives the picture is slightly more complex, as it can involve periphrastic (participial) constructions. This is similar for the Perfect construction, and there are various restrictions on which morphemes it can combine with when it is an affix. Interestingly, even though there are cases where the passive and the perfect have a dummy-auxiliary, in that tense or aspect material can be hosted by a form of ‘be’ or ‘have’, it is not the case that there is in fact a ‘passive’ or ‘perfect’ morpheme that is present. For both these categories the passive and the perfect arises, when periphrastic, from a different distribution of tense, aspect, and participial morphology. Viewpoint aspect (imperfective, progressive etc.) on the other hand is mostly expressed affixal, but is more often the end of the verb-word and can not be followed by most other categories. Thus there are more languages that are similar to Japanese/Turkish than Italian/Greek in the sample. Interestingly, there are no splits within more fine-grained distinctions, but as will be noted in Sec 2.3, this requires more investigation. In other words, it is not the case that a language expresses a subset of viewpoint aspect morphology as synthetic and another subset as periphrastic.

Within the tense domain a difference can be seen between past/present and the future with

regard to their morphological reflexes. Past/present morphology is the most alternating category, as in the example for Japanese in (1): it can be expressed synthetically, but in most languages not when it is combined by viewpoint aspect. Future and the mood and modality categories on the other hand are most often variable, and in many cases expressed periphrastically. In those languages where it is not, there are various other restrictions visible with which tense and aspect morphology it can combine. Thus, in case of the categories higher in the clause instances of ‘AUX-PST’ or AUX-IPFV’ are found. This is crucially different from the categories discussed in (34-36).

Thus, all types of lexical aspect, all types of valency changing morphology (except passive) when they are expressed as functional morphemes never participate in periphrasis in any way. These categories can participate in periphrasis in languages where these categories are expressed as roots, and participate in different types of complementation structures, such as restructuring. However, there are no cases where there are entities of the form ‘*Verb be-semelfactive*’. All other categories do in some for or another participate in bound-morpheme periphrasis, where either the category is periphrastic itself (tense, mood), or cannot combine with other morphology following it (viewpoint aspect). Moreover, all features in a particular category behave the same way in a given language: when a language makes three overt distinctions for valency changing morphology it is not the case that two behave in one way whereas the other behaves differently. The same holds for viewpoint aspect and lexical aspect. These findings can be summarized in two generalizations, repeated from the introduction in (37).

(37) a. *Generalization I*

When *v*, Valency changing morphology, and Lexical aspect are expressed as bound morphemes, they do not participate in periphrasis

b. *Generalization II*

All features expressed as functional morphemes in a single category in a given language behave the same with regard to periphrasis

These generalizations are interesting for various reasons, and will be elaborated on in section 5.3. First, the fact that certain categories do not participate in auxiliary formation (other than roots) at

all. These categories are all lower in the clausal spine. In many descriptions or classifications, these categories are described as ‘derivational’ rather than ‘inflectional morphology. As has been pointed out in Pietraszko (2017) for Ndebele, only inflectional features seem to play a role in periphrasis. The question remains how this is encoded in a language. Interestingly, the two categories where periphrasis starts to play a role, passive and viewpoint aspect, are categories that have been argued (in other works, and in this thesis) to be the end of the first domain of the extended projection of the verb, i.e. on the border of a phasal domain. This would imply that the derivational categories are part of the first phase, and as such could fall out as ‘derivational’ since they are part of the first domain. Another point of interest is the fact that overall, features in a certain category tend to behave the same in a given language. That is, if a language makes three distinctions for viewpoint aspect, all three distinctions either participate in periphrasis or they do not. It is not the case that only a subset of the features behave a one way, and the other subset behaves a different way. Again, this would have been an entirely plausible picture, especially considering theories where each single feature is part of a separate phrase.

In the following these generalizations will be discussed in more detail by discussing each of the categories separately, starting with the lowest head in the clausal spine, *v*, voice and other valency changing morphology.

5.2.1 *v*, voice, and valency changing heads

The discussion starts with morphology dealing with valency changing operations and, to some extent, with verbalizing morphology. As mentioned above, there is much discussion to what is part of this domain. Some examples are given in (38) with different morphological reflexes. In (38a) two languages are presented with affixal morphology for the causative (38a-i in Semelai) and the middle (38a-ii in Kham). Both (38b) and (38c) give passives. English has a periphrastic passive, whereas Latin can have a synthetic passive, or a periphrastic one.

- (38) a. i. kdej ki= [**pa-** k^hom] ha? ?us [Semelai]
 pot 3.AG CAUS- sit at fire
 ‘she set the pot on fire’ (Kruspe 2004, p.128)
- ii. [so- soi **-si** -ke -rə] [Kham]
 CAUS- fatten -MIDDLE -PFV -3.SUB
 ‘They fattened one another’ (Watters 2002, p. 105)
- b. The world **was sold** by the man [English]
- c. i. [laud -ā -t **-ur**] [Latin]
 praise -TV -3.SG -NACT
 ‘s/he is being praised’
- ii. [laud -ā -t -us] [est]
 praise -TV -PASSPTCP -NOM is.IPFV
 ‘s/he has been praised’ (Kastner and Zu 2017, p.662-3)

Without separating out the different types of verbalizing and valency changing classes, the overview of all the languages is given in the following table, 5.3. The table is organized as follows, and follows the distinction made in the example above, (38). The first column lists languages like Semelai and Kham above, (38a) where all this type of morphology is always expressed suffixal. The second column lists those languages that always use periphrastic constructions, and the last column represents languages where there can be alternations for different voice options, which will be discussed below in more detail.

Note that this is only a first approximation and does not explain at all what morphology, such as aspect, tense, and mood, can follow or precede this type of morphology. Second, it is not clear what it means for the third column to be alternating between periphrasis and synthetic forms. One option is as given above for Latin, (38c) where the passive shows up as periphrastic in some feature combinations and affixal in others. But since none of the different types of valency changing morphology is separated out, it also consists of languages that have a periphrastic passive, but a synthetic causative. Thus, underlyingly these languages are both part of the first and the second column in the table.

Thus, in this domain it is important to separate out different categories and this will be done in the next two sections. Interestingly, it turns out that there is a clear split between passive morphology

[V-x]	[V] [x]	[V-x] or [V] [x]
Kinande	English	Evenki
Ndebele		Basque
Shona		Malayalam
North Azeri		Albanian
Turkish		Greek
Semelai		Italian
Kalaallisut		Latin
Armenian		Sahaptin
Japanese		
Nivkh		
Kham		
Newar		
Finnish		
Nez Perce		
Balawaia		
Lavukaleve		
Selepet		
Barai		
Ömie		
Yareba		
Urarina		

Table 5.3: Distribution of Voice morphemes

and all other type of valency changing morphology such as causative, applicative, anti-passives, etc: only in the passive do languages sometimes exhibit periphrastic constructions. All other morphology is always expressed affixally. This finding is similar for similar categories in (Haspelmath 1994). I give some suggestions, also relating this back to Ch 4. Sec. 4.3.1 as to why this category might be exceptional, which might have to do with the fact that might is the highest head in the voice domain.

5.2.1.1 Passive

The first category to be discussed is the passive. This category can be expressed morphologically in various ways, and some representative examples are in (39). Languages, like Finnish, can express the passive with dedicated affixal morphology on the verb, (39a); the passive can be expressed periphrastically as in Hindi, (39b), which in this case does not mean there has to be a morpheme that indicates ‘passive’, which will be explained below; and finally, a language like Latin can alternate

between a synthetic and a periphrastic passive depending on other type of morphology, (39c).

- (39) a. etana [tape -**taan**] [Finnish]
 slug.NOM kill -PASS
 ‘The slug will be killed’ (p. 1. Manninen and Nelson)
- b. salmaa dwaara uske ghar kaa niriksan [ki -yaa] [ga -yaa] [Hindi]
 Salma by her home GEN examine do -PFV go -PFV
 ‘Her house will be examined by Salma’ (Chandra and Sahoo 2013 p.13)
- c. i. [laud -ā -t -**ur**] [Latin]
 praise -TV -3.SG -NACT
 ‘s/he is being praised’
- ii. [laud -ā -t -us] [est]
 praise -TV -PASSPTCP -NOM is.IPFV
 ‘s/he has been praised’ (Kastner and Zu 2017, p.662-3)

Each of these languages are representative for a larger group of languages, which is summarized in table 5.4. The first column lists languages where the passive is always expressed with an affixal morpheme on the verb, as in Finnish; The second column represents the group like Hindi, where the passive is always expressed via some type of periphrastic construction; the third column represents alternating languages. The final column lists the languages that do not express the passive in any way on the verb, even though these languages might have other means of expressing the passive which is not indicated via the verb. ⁷

⁷Not in table: Kinande, Archi

[V-x]	[V] [x]	[V-x] or [V] [x]	no X
Ndebele	Basque	Evenki	Semelai
Shona	English	Albanian	Nivkh
Turkish	Hindi	Latin	Kham
Kalaallisut	Malayalam		Newar
Armenian	Sahaptin		Nez Perce
Japanese	Italian		Balawaia
Finnish	Evenki		Lavukaleve
Urarina	Greek		Barai
Mosetén			Selepet
			Ömie
			Yareba

Table 5.4: Distribution of Passive morphemes

For the first category, where the passive is always expressed as an affix, it is also possible to combine this marker with any type of other morphology. Some examples are given for Turkish, where the passive can combine with past marking and the ability marker, (40). The same holds for other morphemes, and for other languages. In this sense the languages in the first column have a passive form that patterns with the other valency changing morphology discussed in the next section.

- (40) a. [keşf -ed -il -'di] [Turkish]
 discovery -do -PASS -PST
 'x was discovered (by y)' (based on Kornfilt 1997, 323)
- b. [[ver -il -ebil -ir] -di]
 give -PASS -ABIL -HAB -PST
 'it could be given to him/her'

The second and third group, where languages are listed that alternate between a synthetic and periphrastic form fall into different categories. For the third group there are either differences for different aspectual values, as in Latin above and Albanian; in other cases it depends on the type of passive that is used, i.e. if it is a personal or impersonal passive, which is for example the case in Italian and Mosetén.

The languages in the second group all express the passive periphrastically, as shown for Hindi in (39b). However, in these cases, even in Hindi, there is no morpheme that is only used for the passive.

Rather, different constructions are used, i.e. Hindi uses a light verb construction, whereas other languages use an auxiliary verb which hosts tense, and the verb has participial morphology. This participial morphology is found in other constructions as well, such as the perfect or in adjectival position. This is shown for English, but is also found in the other languages in group 2 and 3 above.

- (41) a. The golden compass **was stol -en** from Lyra [Passive]
 The g. c. AUX.PST steal.PST -PART from L.
 b. Lord Boreal has **stolen** Lyra's compass [Perfect]
 c. The **stolen** compass was taken back by Lyra with the help of The Subtle Knife [Adjectival]

Thus, when the passive is expressed periphrastically there is a dummy auxiliary verb, but there is no passive morphology per se. Moreover, as pointed out in Sec. 4.3.1 in the previous chapter, this auxiliary, at least in English, behaves differently from the other *be* auxiliary (Akmajian and Wasow 1975). There are several observations that relate to the periphrastic passive construction. In some languages, like English, there is an auxiliary to host tense information, but this is not the case in all languages (like Mosestén). However, languages that use a periphrastic construction for the passive generally use a participial form of the verb (this is the same in English and Mosestén, see also Haspelmath 1994). Crucially, only when the passive is not expressed by dedicated passive morphology is there periphrasis. In those languages where there is a passive morpheme, there is no periphrasis, similar to all other voice morphology discussed in the next section. Second of all, in some cases, like Latin or Italian, the morphology that is used in the passive morphology can be used for other morphology as well and, interestingly, does not always show up close to the verb root. That is, it can show up in a higher position than the clausal position would suggest. This has led to analyses where the passive morpheme can be a specifier rather than a head, or is a clitic that can be displaced (Baker et al. 1989, Calabrese 2019, a.o.).

Why would it be that only this category is expressed periphrastically, and not any of the other valency changing morphology? As it stands, this is a problem for the theory advocated for here, that head movement is possible until the phase head. If the passive is a head below the phase, there

should be no a-priori reason that head movement is blocked by the passive. I do not provide a solution here, but only some observations as to why the passive might be an exception. Crucially, it is only an exception in those cases where the passive is not expressed by dedicated passive morphology.

There are two possibilities that might point to the beginning of a solution.⁸ The first solution has to do with the location of the passive projection in the clausal spine. Theoretically speaking, the passive(voice) phrase to have been argued to have been the highest projection in the verbal/argument domain and in some cases has been argued to in fact be a phase head (Kratzer 1996, Pykkänen 2002, 2008, Collins 2005, Alexiadou and Doron 2012, Bruening 2013, Legate 2014, Sundaresan and McFadden 2017). If it is the case that the passive is a phase head then it is not a surprise under the analysis proposed here that head movement is blocked, if head movement takes place after the phase is sent to spell-out. However, this does not account for all the data, since there are many languages where there is a passive morpheme that does not block head movement. The rationale used in the previous chapters to account for synthesis between aspectual and tense morphemes on the verb was that there is a step before head movement in those languages. Thus, it would mean that in case of the passive, a refinement of the phasal boundaries is necessary, and a refinement for various domains with regard to head movement. In other words, under such an approach the variation between periphrasis and synthesis comes from the timing of head movement at a different level.

A second potential direction to explore in the future would be to say that the passive in those languages where it is periphrastic, involves a different type of structure than in those where there is synthesis. As mentioned before, there are analysis that assume that the passive morpheme in some languages is not a head but a specifier (Baker et al. 1989, Calabrese 2019, a.o.). If that is the case, what needs to be explored is why languages have this choice, and how creating syntactic units through head movement versus movement of specifier and heads can have different effects.

⁸Even though they are not part of the language sample here, some Scandinavian languages can alternate between periphrastic and synthetic passives (Heltoft and Falster Jakobsen 1996, Engdahl 1999, Holmberg 2000). There are various restrictions as to which passives allows what type of readings, and it would be interesting to use the tests available in those languages for the language sample here.

To summarize, the (periphrastic) passive requires more scrutiny, but at least it seems to be a different type of construction. However, if there is dedicated passive morphology, it is always expressed as an affix on the verb and does not participate in periphrasis. In this sense it is similar to the valency changing morphology discussed in the next section.

5.2.1.2 Other valency changing morphology

This section focuses on all other verbal and valency changing morphology that is not the passive. The reason is that all these different categories pattern the same in that all of them are affixal. Some examples for different types are given in (42): causative morphology is given in (42a) for Semelai; an applicative in (42b) for Ndebele; a transitivity morpheme in Malayalam (42c); reciprocal and reflexive morphology in Sahaptin in (42d); middle morphology in (42e) for Kham; and class marking in Yareba in (42f).⁹

- (42) a. kdej ki= [**pa-** k^hom] ha? ?us [Semelai]
 pot 3.AG CAUS- sit at fire
 ‘she set the pot on fire’ (Kruspe 2004, p.128)
- b. [Ngi- phək -**el** -a] abantwana [Ndebele]
 1.SG cook -APPL -FV 2child
 ‘I cook for children’ (A. Pietraszko, p.c.)
- c. kut̪ti uup̪naal [aa̪t̪ -t̪ -i] [Malayalam]
 child swing swing -TRANS -PST
 ‘The child swung the swing’ (Asher and Kumari 1997, 275)
- d. i. áswan [**piná-** ílamayk -sha] [Sahaptin]
 boy REFL- hide -IPFV
 ‘The boy is hiding himself’
- ii. [**pápa-** wyák’uk -xa]
 RECIP- gather -PST
 ‘They gather together’ (Jansen 2010, p. 320)

⁹I grouped various types of valency changing morphology under ‘(in)transitivity’ and thus form heterogeneous group. For example, there is actually morphology that is used on an intransitive verb to make it transitive in Malayalam, but I also grouped the very few antipassives in this group. This is done because they all behave the same with regard to periphrasis.

- e. [so- soi -**si** -ke -rə] [Kham]
 CAUS- fatten -MIDDLE -PFV -3.SUB
 ‘They fattened one another’ (Watters 2002, p. 105)
- f. [i -**t** -a -su] [Yareba]
 eat -CLASS -PRS -3.SG
 ‘He is eating’ (Weimer 1972, p.60)

These examples are representative for many more languages, which are all listed in table 5.5. The table is organized as follows. The first column lists all the languages, according to the amount of categories that can be expressed. Thus, the first group only has a single grammatical marker, second group three markers, etc. The other columns lists the type of features that are available. Note that the languages that only have a single grammatical category, it is always the causative, except for Barai and Ömie (New Guinea) . This causative category in general is the type that is present in most of the languages in the sample. I included a separate category labeled (in)transitivizer, which includes morphology to express that a verb which is generally intransitive is now transitive, or vice versa.¹⁰

¹⁰Archi is not included into this table due to not having enough information at this moment.

	Caus	Applicative	(In)transitivizer	Recip/Refl.	Middle	class
North Azeri	✓					
Turkish	✓					
Basque	✓					
Hindi	✓					
English	✓					
Japanese	✓					
Nivkh	✓					
Newar	✓					
Lavukaleve	✓					
Latin	✓					
Barai				✓		
Ömie						✓
Yareba		✓				✓
Italian	✓			✓		
Armenian	✓	✓		✓		
Balawaia	✓	✓		✓		
Greek	✓				✓	
Albanian	✓				✓	
Kham	✓				✓	
Urarina	✓					✓
Selepet		✓	✓	✓		
Evenki	✓		(✓)	(✓)		
Malayalam	✓		✓	✓		
Kinande	✓	✓		✓?		
Ndebele	✓	✓		✓		
Shona	✓	✓		✓		
Kalaallisut	✓			✓	✓	
Sahaptin	✓			✓		✓
Semelai	✓.	✓			✓	
Nez Perce	✓?	✓	✓			
Mosetén	✓	✓	✓	✓	✓	✓

Table 5.5: Distribution of *v* and valency changing morphemes

At this point I did not make a distinction between how these categories are expressed. There are two strategies: either via a type of complementation structure with a light verb plus an infinitive, or affixal. This first type can be exemplified with English, (43), the others have been exemplified above in (42). In English there is a light verb *make* with the infinitival form of the verb.

(43) Lyra **makes** her Daemon Pantalaimon **sleep** on her shoulder

[English]

These type of constructions have been analyzed as the auxiliary verb being a verb itself, i.e., a free morpheme or a root, and not as a bound morpheme that needs a host. In other words, these markers are analyzed as types of restructuring predicates (Cinque 1998, 1999, Wurmbrand 2001, and many others). Thus, they are in many ways similar to constructions discussed in chapter 2 regarding aspectual verbs in Japanese, and they are not similar to periphrastic constructions where one of the morphemes is hosted by a dummy auxiliary. Since in this case there are two verb roots, the periphrasis can come from the status of the causative morpheme, rather than from the combination of the causative and the verb stem, as discussed in the introduction. Many languages in this sample have this type of causative construction as well: Basque, Kham, Malayalam, Evenki, Italian, Nez Perce, Sahaptin, Semelai, Ndebele, and Mosetén. In general all these languages have a restructuring causative, and an affixal one (or more than one), which have different functions.¹¹

When these root-root causatives are separated from the rest of the cases, all other morphology in this category is always affixal, as presented in (42). That is, there are no cases where any of these markers in table 5.5 are hosted by an auxiliary such as *be*. Second, none of this morphology is the cause for higher markers to be expressed periphrastic as well. That is, it can always be followed by other morphology, even other *v* or valency changing morphology. Examples are given from Mosetén and Turkish. In Mosetén the causative, class marking and an applicative marker can co-occur (44a), or the class marker, the antipassive and the progressive (44b). In Turkish it is possible to have a causative of a causative, (45a), or a causative followed by tense, (45b).

- (44) a. yäe nl'ash [raej **-ji'** **-ye** **-ye** -te] öi saeks-e-dye' iits
 1.SG FOC stop -CAUS -CLASS -APPL -3.MASC.OBJ DEM eat-CLASS-NOM DEM
 nanatyi'
 boy
 'I made this boy finish the food' [Mostén]
- b. fer-tyi'-khan tsiin [karij **tya** **-k** **-wa'jo**-i]
 strong-INFL-INFL sun work -CLASS -AP -PROG -M.SG

¹¹Sanskrit, even though not in the language sample, might be an exception to this generalization. This language has a periphrastic causative-perfect (Kiparsky 2005), where the causative might be a type of light-verb like in English, but this verb is only used for the causative. However, Kiparsky discusses this type of periphrasis as coming from a phonological constraint rather than from the features, or the status of the morphemes themselves. If that is the case, the generalization that no valency changing morphology is ever periphrastic with a dummy auxiliary still holds.

‘He is working in the strong sun’ (Sakel 1973, p. 260)

(45) a. [imzala -t -tur -dı -m] [Turkish]
 sign -CAUS -CAUS -PST -1.SG
 ‘I made *x* make *y* sign’ (Aisen 1979)

b. [koş -tur -'du]
 run -CAUS -PST
 ‘*x* made *y* run’ (based on Kornfilt 1997, 331)

To conclude, all valency changing and class marking features have very different morphological reflexes from the passive. Even though some valency changing operations, such as the causative, can be expressed with complementation structures similar to restructuring, most morphology, is always affixal and never participates in periphrasis. Note that this is different from passive marking, in various ways, since the passive can be periphrastic. Moreover, even though it is possible to combine different valency changing morphology, it has been argued that it is generally not possible (or at least very rare) to have passives of passives (Perlmutter and Postal 1984, Legate et al. 2020). As will become clear in the next section, lexical aspect is very similar to the categories discussed here, in that lexical aspect can be expressed via restructuring, or is always affixal.

5.2.2 Aspect

As discussed in the previous section, I distinguish three classes of aspect: lexical aspect, viewpoint aspect, and the Perfect. Each class is discussed in the following sections. As will become clear the three classes of aspect have different behavior regarding affixation and periphrasis. First of all, Lexical aspect is grammatically expressed by the fewest languages, and this type is overwhelmingly expressed via affixation. I show that there are two groups of languages: those where the lexical aspect categories are always expressed as functional morphemes, (46a), and those where the morphemes are expressed by roots, (46b). The latter groups together with cross-linguistic patterns regarding restructuring verbs, and is in this sense similar to what has been discussed for Japanese in chapter 2. Both types are exemplified in (46) for Yareba and Japanese.

- (46) a. [*yau -r* **-edib** -i -nu] [Yareba]
sit -CLASS -REP -NEAR.PST -3.SG
‘he was repeatedly sitting down’ (Weimer 1972, p.61)
- b. [[*hedatar* -i] -hajime -ru] [Japanese]
become.distant -v -begin -PRS
‘It begins to become distant’

Interestingly, the only type of periphrastic construction for these features is one where the category is expressed as a root, i.e. in restructuring contexts. This is thus similar to the causative constructions discussed above. This means that no type of lexical aspect, when it is expressed as a bound morpheme ever is expressed on a dummy auxiliary, nor do higher categories need to be hosted by a dummy auxiliary because of the lexical aspect morpheme. Thus, lexical aspect is never expressed in the same periphrastic type construction as for example viewpoint aspect or tense is. This is the same result as for the valency changing morphology in the previous section.

Viewpoint aspect is similar to lexical aspect in that the most used strategy is affixation as well. But there are two major differences. First of all, the features are never expressed as roots, i.e. in restructuring contexts. However, it is necessary to discuss variation in the progressive marking, since there is cross-linguistic variation as to how this category is expressed. In various cases this category can be expressed with a nominalized structure, as for Basque,(47), or can be expressed with a prepositional construction, as in Dutch, (48). I show how these constructions are different from the periphrastic constructions under investigation.

- (47) *amakume-a ogi-ak* *ja-te-n* **ari** *da* [Basque]
woman-DET bread-DET.PL eat-NML-LOC PROG 3.ABS.is
‘The woman is eating (the) bread.’ (Laka 2006, p.173)
- (48) *Pluk en de Stampertjes **zijn** frietjes **aan het eten** op de matrasvloer* [Dutch]
Pluck and the Stampers are fries on the eating on the matras.floor
‘Pluck and the Stampers are eating fries on the floor of mattresses’

Thus, lexical aspect and viewpoint aspect differ with regard to the availability of the feature being expressed as a root or not. Second, even though both types of aspect generally use affixation, there is a big difference in what categories can follow the morphemes. The differences is that far

less categories can follow viewpoint aspect as an affix on the verb than with lexical aspect. That is, viewpoint aspect, even though it is itself expressed as an affix, more readily involves periphrastic constructions for higher categories than lexical aspect does..

The final category discussed for aspect is the Perfect. Again, this category has a different morphological signature than the other two types of aspect. As I show, on the surface there seems to be more variation in that languages differ more if the perfect is expressed as affixation or as a periphrastic construction. There are various restriction as to what other morphemes can occur on the verb, in the languages that only have an affixation strategy. Interestingly, in those languages that only have a periphrastic construction, there is no dedicated morpheme on the verb or on the auxiliary that is solely used to indicate perfect, similar to the passive construction discussed in the previous section. Rather, it is a combination of viewpoint aspect and tense morphology that is expressed in a different way than usual to indicate the perfect. An example of an affix-only language is given in (49a) for Nez Perce (Sahaptin), and of a periphrastic-only language in (49b) for Kham (Sino-Tibetan).

- (49) a. [híp -s] [Nez Perce]
 eat -PRF
 ‘I have (just) eaten’ (Crook 1999, p. 98)
- b. nəm te [nup -na -də] [le] [Kham]
 sky FOC set -go -**non.fin.** be.3SG.IPFV
 ‘The sun had begun to set’ (adapted from Watters 2002, p. 280)

I argue that this behavior is in line what has been discussed in the previous chapters, and previous literature for the Perfect that there is an additional, dedicated position in the clausal spine. I show in Sec. 5.2.2.3 how this falls out.

Before moving to each of these categories in detail, the following picture arises: Lexical aspect, just like most valency changing morphology never participates in periphrasis (apart from complementation structures). Under a phasal approach to word building this is expected, since both types are inside the first syntactic domain, where head movement takes place. Viewpoint aspect on the other hand is affixal itself, but there is language variation if other categories can attach to this

marker as an affix. This was also discussed in the previous chapter, where I argued that languages can systematically differ whether head movement can take place before or after spell-out. Finally, the Perfect, can generally not be combined with other type of morphology, and leads most often to a periphrastic construction.

5.2.2.1 Lexical Aspect

As mentioned in Sec 5.1.2.2 Categories in lexical aspect are concerned with a property of an individual predicate and gives further information about the type of event. Apart from notions like telicity and stative/eventive predicates, there are many labels that are used in descriptions that are closely related to viewpoint aspect such as durativity, pluractionality, iterativity and punctuality. Two examples are given for Barai (Koriarian) and Dolakha Newar (Sino-Tibetan) in (50). The first language instantiates the lexical aspect morpheme ingressive as an affix on the verb, whereas the terminative morpheme in Newar is expressed in a word separate from the verb, and the verb carries infinitival morphology.

- (50) a. Vito [va- **kuve**] [Barai]
 Vito go -INGRS
 ‘Vito is starting to go’ (Olson 1975, p. 477)
- b. jin wā ām turkan [wa -i] [**twārtār** -gi] [Dolakha Newar]
 1.SG.ERG TOP that mustard sort -INF TERM -1.SG.PST
 ‘I stopped sorting that mustard’ (Genetti 2007, p. 386)

These two languages instantiate the two options that exist in the language sample. Other languages in either group are listed in table 5.6. The largest group consists of languages that use an affixation strategy, and there are only a couple that use a periphrastic strategy. Note that there is a considerable group of languages in the sample that do not have grammaticalized lexical aspect at all.

[V-x]	[V] [x]	No x
Ndebele		North Azeri
Kinande?	Basque	Turkish
Shona	Malayalam?	Albanian
Evenki	Newar	Hindi
Semelai		Latin
Kalaallisut		Finnish
Armenian		Nez Perce
English		Selepet
Greek		
Italian		
Japanese		
Nivkh		
Shapatin		
Balawaia		
Lavukaleve		
Barai		
Ömie		
Yareba		
Mosetén		
Urarina		

Table 5.6: Distribution of Lexical Aspect morphemes

First of all, observe that in this case it is an all or nothing situation: none of the languages alternate between affixation or periphrasis. Thus, if a language has lexical aspect morphology, all morphemes behave identical. For example, Dolakha Newar has apart from a terminative marker, (50b) also an ingressive marker, an inceptive marker, and a resultative marker, (51). Note that in all of these cases the main verb has infinitival morphology.

- (51) a. $\bar{a}le \bar{a}mun \quad kh\bar{a} [l\bar{a} \text{ -i }] [suru] [yet \text{ -ai }]$ [Ingressive]
 then 3.SG.ERG tak talk -INF begin do -3.SG.PRS
 ‘Then he starts talking’ (Genetti 2007, p. 386)
- b. $dolakh\bar{a}=e \quad me [hal \text{ -i }] [ten \text{ -agi }]$ [Inceptive]
 Dolakha=GEN song sing -INF about.to -1.SGPRS
 ‘I am about to sing a Dolakha song’ (Genetti 2007, p. 385)
- c. $\bar{a}m \quad bel\bar{a} \quad nikkai [khi\bar{i}ga \text{ -i }] [doŋ \text{ -gu }]$ [resultative]
 that time very dark -INF finish -3.PST
 ‘At that time, it had become very dark
 (Lit. The darkening was finished) (Genetti 2007, p. 384)

An overview of the features that are grammatically encoded in each language are given in table 5.7. Even though some languages only have one marker, such as Armenian which has only an iterative marker, many languages have multiple markers, an overview is given below. Other languages with a fairly limited set (1 or 2) of aspectual distinctions are for example Semelai and Lavukaleve. Languages that have multiple markers include for example Evenki, Kalaallisut, Japanese, Barai, Ömie and Mosestén and Dolakha Newar. The first rows in the table include languages that make lesser (overt) grammatical distinctions, and the lower rows make more distinctions. Observe that there is a lot of variation, and that there does not seem to be a clear generalization or implication as to which categories are expressed in what language. In each group with a certain amount of markers, there are languages from various families.

	INGRS	INCEPT	PUNCT	SEMELF	REP	CONT	RES	TERM
Basque	✓							
Malayalam	✓							
Armenian					✓			
Shona					✓			
Lavukaleve						✓		
Italian	✓							
Yareba					✓	✓		
Balawaia						✓	✓	
Semelai					✓		✓	
Sahaptin	✓	✓						✓
Ömie	✓		✓	✓				
Barai		✓				✓	✓	
Ndebele					✓	✓	✓	
Urarina					✓	✓	✓	
Nivkh	✓			✓	✓		✓	
Japanese	✓					✓	✓	✓
Mosestén		✓			✓	✓	✓	
Evenki	✓	✓			✓	✓	✓	
Newar	✓	✓				✓	✓	✓
Kalaallisut	✓					✓	✓	✓

Table 5.7: Overview of Lexical Aspect distinctions

The remainder of the section focuses on two elements: the first element deals with the status of the morphemes of the features that are expressed, i.e. if they are roots or functional morphemes.

This in turn furthers the understanding of the status of the languages using periphrastic constructions. Second, I focus on which categories can precede and follow. Regarding the first question, what the status is, I show that there is a split between languages where there is affixation (or where it is not possible to tell), and languages that express the categories via a root. Without going into too much detail as what restructuring is, I show that this fits with what is discussed in the literature regarding restructuring verbs, and this discussion is similar to the discussion of Japanese aspectual verbs in Chapter 2. The only type of periphrasis that is found in the language sample are cases where the category is expressed via a root, and not via a bound morpheme hosted by a dummy auxiliary. Put differently, there are no auxiliaries of the type ‘AUX-SEMELFACTIVE’. Regarding the second point, I show that many of the higher categories can be attached to the lexical aspect morpheme. This will be different from any of the other categories discussed later.¹² Moreover, this holds for languages that have the restructuring option, and languages that seem to only use a affixal morpheme to express a specific category. That is, true lexical aspect bound morphemes are always affixes are never hosted by an auxiliary, nor are they the cause of the higher morphemes to be expressed as an auxiliary. This is the case for languages in the sample that are said to be more agglutinating and languages that are not.¹³ In order to see this last point, regarding the generalization that lexical aspect as bound morphemes never participate in periphrasis with a dummy auxiliary, it is important to first understand the languages where the categories are expressed as roots.

In Chapter 2 I discussed lexical aspect verbs in Japanese. I showed that there is a class of morphemes that seem to behave differently with regard to their phonological and syntactic behavior with respect to other aspectual (or tense) morphology. The data I discussed were the following, (52-54). The verb with lexical aspect markers behave as if there are two words for certain tests, but as one word for others. That is, for some tests the lexical aspect morpheme patterns with verbs with

¹²It could be the case that some of the morphemes that I have identified as affixes are in fact roots. This was not possible to investigate in detail due to the lack of descriptions of their phonological and syntactic behaviour. However, all periphrastic constructions can be identified as having a root expressing a particular category and not a bound morpheme.

¹³Regarding the last observation: it can be the case that higher morphemes are expressed as an auxiliary, but then this morpheme is expressed as a morpheme in many other contexts as well, and it is thus not due to the combination of lexical aspect and the other category.

the progressive, which always behave as two words for the tense and progressive morpheme, and for others it patterns like CAUS-tense verbs which always behave as a single unit.

- (52) a. (L H H H H H H L)_ω
 he. da. ta. ri. ha. ji. me. ru.
 b. [[hedatar -i] -hajime -ru] [Begin]
 become.distant -INF -begin -PRS
 ‘It begins to become distant’
- (53) a. (L H H H H L)_ω
 he. da. ta. ra. se. ru
 b. [hedatari -sase -ru] [Causative]
 be.distant -CAUS -PRS
 ‘To make it distant’
- (54) a. ((L H H L)_ω L)_ω
 he. da. ta. te. ru
 b. [hedatar te] [-ru] [Progressive]
 be.distant -ASP -PRS
 ‘It is being distant’

Both verbs with lexical aspect markers, (52), and voice morphology, (53) have a single domain for pitch accent assignment that also includes the tense morpheme, whereas a verb with a progressive marker excludes the tense for pitch accent. The morphological make-up for (52) is different however, from the other verbs in that it includes a verbalizing morpheme. With regard to syntactic tests, I have shown that it behaves for some tests as if it were two words (conjunction), which is similar to the verb with the progressive, and for others as if it were a single unit (no elements can intervene, or subpart can be moved around). I concluded that they are formed in a different way from true affixation (53) or true periphrasis, (54), but the aspectual heads are spelled out as roots, which means that they form a type of compound. The fact that the verbs with lexical aspect have two roots, is in line with the syntactic behavior of these verbs in the restructuring literature in Japanese (Shibatani 1973, 1978, Kuno 1987, Kageyama 1993, 1999, Nishigauchi 1993, Koizumi 1995, Matsumoto 1996, Fukuda 2012).

All of the aspectual markers in the table in 5.7 that occur as two words are in fact like Japanese: the morphemes are roots rather than bound morphemes hosted by a dummy auxiliary. This is for

example the case in the examples in Newar in (51) where each of the markers can occur as lexical verbs as well. However, when they occur in a periphrastic construction as part of the extended projection of the main verb, the main verb is expressed with an infinitival marker. Other indications that they the verb expressing lexical aspect is a verb in the extended projection of the main verb is the fact, according to Genetti (2007) that the arguments receive case marking from the lexical verb, and not from the aspectual verb (that is, some of the aspectual verbs when used as a main verb occur as an (in)transitive verb, but this does not matter in the cases where they are part of another lexical verb). Moreover, even though they are represented as a two-word construction, they are in fact phonologically similar to the Japanese verbs: According to Genetti (2007) these verbs form a single prosodic contour with the main verb and no material can intervene. This is similar to the Japanese verbs where there is a single pitch accent domain. Finally, generally in Newar there is a large amount of word order freedom with noun phrases, but this word order freedom is lost with infinitive+lexical aspect auxiliaries, indicating that they are part of the extended projection of the main verb. Based on this description, I argue that these aspectual markers are roots rather than functional morphemes needing a host. The other languages in the sample here that have periphrastic constructions behave similarly to the cases discussed in Newar and Japanese: that is, the features are expressed as roots rather than morphemes needing a host.

Thus, some languages use roots to express lexical aspect features. This can be either done in a type of periphrastic construction, or as a compound verb, like in Japanese. The fact that it is this particular aspectual category has been discussed for many language families and isolates, for example Austronesian (Chung 2004); Basque (Arregi and Molina-Azaola 2004); Dravidian (Agbayani and Shekar 2008); Germanic (Wurmbrand 2001); and Romance (Aissen and Perlmutter 1976, 1983, Strozer 1976, Rizzi 1978, 1982, 1986, Cinque 1999, 2004). Some other languages that seem to exhibit root-like behaviour are Mosestén, Shona, Italian. Overall, in the language sample discussed here, the following languages have restructuring verbs for lexical aspect: Basque, Malayalam, Lavukaleve, Ndebele, Japanese, Newar, Kalaallisut, and Italian.¹⁴

¹⁴It could of course be the case that there are languages in the sample where the morphemes are in fact expressed as roots rather than bound morphemes and should be included in the list. Even though in the languages discussed so

Now I turn to the other issue, namely which combinations with morphemes from other classes are possible? First of all, none of the lexical aspect affixes is itself ever hosted by a dummy auxiliary such as *be*. The only time lexical aspect is expressed in a periphrastic construction is in a restructuring environment. Second, in all of the languages it is possible to follow the lexical aspect morpheme by most other morphemes. Some examples are shown for Evenki (Tungusic), for the iterative. This marker can for example be followed by the iterative past (55a) the perfective, (55b), or the imperfective, (55c).

- (55) a. beje-l er hokto-li [girku -vani -ngki -tyn] [REP PST]
 man-PL this road-CASE go -REP-iter.pst -3.PL
 (lit) 'The men walked-repeatedly-usually-in-the-past along this road' (Nedjalkov 1997, p. 258)
- b. girki-v min-du oro-r-vi [bu: -vet -te -n] [PFV]
 friend-1.SG.POSS I-DAT reindeer-PL-POSS.REFL. give -REP -PFV -3.SG
 'My friend gave me his reindeer several times' (Nedjalkov 1997, p. 249)
- c. oro-r o:kinda [sucha -van -d'e -vki -l] [IPFV]
 reindeer-PL always break.loose -REP -IPFV -HAB -PL
 'Reindeer always try to break loose' (Nedjalkov 1997, p. 257)

Thus, the following pattern arises. Languages can differ for how many categories are expressed grammatically (Armenian versus Evenki), and languages can differ if the categories are expressed via a root or a affixal morpheme needing a host. Only when they are expressed as roots are periphrastic constructions possible. In the cases where they are affixal morphemes, the only possible option for all these categories is to express these morphemes as an affix on the verb. The markers can never be hosted by an auxiliary verb, nor do higher categories get expressed as an auxiliary because of lexical aspect features. Thus, lexical aspect bound morphemes never participate in periphrasis.

far I provided evidence that they are in fact a morphological reflex of the underlying difference in syntactic structure, this is not always clear. For example in Kalaallisut there is no infinitival morphology or phonological differences to show that the main verb and the aspectual morpheme form a compound. However, there are various morphemes that can also occur with different morpheme orders that are similar to restructuring verbs in other languages (Grimshaw and Mester 1985). Variable morpheme order is not immediately an indication for restructuring, and there should be other indications for the material being a root rather than a bound morpheme. However, even if it is the case that there are more languages with root-morphemes, it still means that no lexical aspect markers are expressed with a dummy auxiliary. Even if most of the languages have in fact roots rather than affixal morphology, the question is why that is the case with these categories rather than with others.

- ii. amakume-a ogi-ak ja-te-n **ari** da
 woman-DET bread-DET.PL eat-NML-LOC PROG 3.ABS.is
 ‘The woman is eating (the) bread.’ (Laka 2006, p.173)

- c. i. The man is [sell **-ing**] the world
 ii. The world was [be **-ing**] [sold]

As was the case in the discussion of other categories, these examples instantiate groups of languages, which are summarized in Tab. 5.8. Again, the largest group of languages uses an affixation category, shown in the first column. Then there is also a group of languages that alternates. As was illustrated for Basque and English, and will become clear below, this is not a single group and can be split out. Finally, there are several languages that do not express viewpoint aspect in a grammaticalized way.¹⁵

¹⁵Note that a couple of languages have a ‘¿’, whether they have viewpoint aspect or not. The question is whether the categories are in fact viewpoint or lexical aspect. For either option it would mean that there is still only affixal lexical aspect, or in the case of Newar, a root-like element.

[V-x]	[V-x] or [V] [x]	No x
Kinande	Basque	Ömie
Ndebele	Albanian	Yareba
Shona	English	Newar?
North Azeri	Hindi	Nivkh?
Turkish	Italian	Balawaia?
Evenki	Newar?	
Semelai	Lavukaleve	
Malayalam		
Kalaallisut		
Armenian, East		
Greek		
Latin		
Japanese		
Archi		
Nivkh?		
Kham		
Finnish		
Nez Perce		
Sahaptin		
Balawaia?		
Selepet		
Barai		
Mosetén		
Urarina		

Table 5.8: Distribution of Viewpoint Aspect morphemes

Before looking at which morphemes can precede and follow the viewpoint aspect morphemes, it is important to separate out two types of constructions, which will change the content of the second column in the table. After this I show that in all cases where there is affixation or the use of a dummy auxiliary, that there are two groups of languages: those that have morphemes following viewpoint aspect, and those that do not. I show that the former group is not a homogenous group, in that languages make different choices regarding the expression of tense and modality. This will be discussed in more detail below.

First, I turn to the additional periphrastic structures. Except for English and Newar, all languages that are listed have an alternation between different types of aspect. Except for Lavukaleve, all languages have a periphrastic progressive construction. Examples are given in (57), whereas

Lavukaleve has a periphrastic habitual, (58).

- (57) a. amakume-a ogi-ak ja-te-n **ari** da [Basque]
 woman-DET bread-DET.PL eat-NML-LOC PROG 3.ABS.is
 ‘The woman is eating (the) bread.’ (Laka 2006, p.173)
- b. [**po**] [punoj]
 PROG work.IPFV [Albanian]
 ‘I am working’
- c. lataa-ji gaanaa gaa **rahi:** hĒ [Hindi]
 lataa.FEM-HON song.MASC sing PROG.FEM.PL be.PRS.FEM.PL
 ‘Lataa-ji is/was singing a song’ (Bhatt 2007, p.3)
- d. Lo senti? **sta** russando [Italian]
 him hear.you? PROG snore
 ‘Can you hear him? He is snoring’ (Cinque 2017, p.541)
- (58) [e-i] [le **-me**] veva [Lavukaleve]
 3.SG.OBJ 1.PL -HAB in.that.way
 ‘We would (always) do it in that way’ (Terrill 2003, p. 385)

Turning first to the PROG markers, there is in fact variation as to what type of structure is involved (Cinque 2017). This has for example been argued for Basque (Laka 2006, Anand and Nevins 2006, Bhatt 2007, Coon 2010). Evidence comes from different alignment patterns with the progressive and other aspectual marker and different morphology on the verb. This can clearly be seen in Basque, (59-60). The perfective (and imperfective, not shown here) has absolutive-ergative alignment on both the auxiliary and the agent (59), whereas the progressive does not, (60). Moreover, the morphology of the verb is different, where the progressive takes a nominalized verb, and the PFV does not. Coon (2010), in her work, shows that there are several languages that follow a similar pattern, namely Chol (Mayan), several Nakh-Daghestanian languages, two Amazonian languages, and several Indo-Aryan languages.

- (59) emakume-a-k ogi-ak ja-n d-it-u [Basque]
 woman-DET-ERG bread-DET.PL eat-PFV 3.ABS-PL-have.3.ERG
 ‘The woman has eaten (the) breads.’ (Laka 2006, p.177)
- (60) amakume-a ogi-ak ja-te-n **ari** da
 woman-DET bread-DET.PL eat-NML-LOC PROG 3.ABS.is
 ‘The woman is eating (the) bread.’ (Laka 2006, p.173)

Thus, just as with the restructuring constructions for the causative and various lexical aspect marking, the progressive might involve a nominalized structure in some languages. As has been observed in the other language samples, in many languages the PROG is marked in various ways, including nominalized constructions and via a prepositional construction. (Dahl 1985, Bybee 1985, Bybee and Dahl 1989, Bybee et al. 1994, Cinque 2017).

Finally, a note on the habitual in Lavukaleve. I am not sure about the status of this habitual marker in Lavukaleve, since there is not much evidence if this is a periphrastic form (which is how it is written in the grammar, and it occurs after negation) or not (since it always occurs adjacent to the verb, except for focus markers which focus the lexical part of the verbal complex). This marker can only cross-reference the subject, and does this with special marking. The agreement on the habitual marking is obligatory, whereas this is not the case on other verbs. The element is derived from the lexical verb ‘continue’, and the meaning of the habitual is to refer to typical or habitual events, or events that take time to be carried out (Terrill 2003). I don’t know why this is the only language with habitual and if can fit a similar analysis as the progressive in Basque. Put differently, it is not clear at this point why it should always be the progressive that leads to nominalized (or bi-clausal) structures, but other types of imperfective marking, such as the habitual do not. Of course, this might be an accidental gap in the language sample.

Taking out these type of different structures, the following picture arises with regard to other viewpoint aspect marking: overwhelmingly, viewpoint aspect is expressed as a bound morpheme that is expressed as an affix. This can include a simple IPFV/PFV distinction, as is for example the case in Armenian, but can also involve habitual marking, progressive, continuous, or prospective marking. Several examples are given below for the imperfective in Finnish, (61a); the perfective in Evenki, (61b); the habitual in Selepet, (61c); the progressive in Shona, (61d); the continuous in Balawaia, (61e); and the prospective in North Azeri, (61f).

- (61) a. [*kävel -i -n*] *kotiin* [Finnish]
 walk -IPFV -1.SG home
 ‘I walked home’ (White 2006, 186)

- b. bejumimni ulle-ve [lo:van -e -n] [Evenki]
 hunter meat-ACC.DEF hang.for.drying -PFV -3.SG
 ‘The hunter hung meat for drying’ (Nedjalkov 1997, p.252)
- c. [ari -**mini** -wan] [Selepet]
 go -HAB -REM.PST.1.SG
 ‘I used to go’ (McElhanon 1972, p. 247)
- d. [nda- nga] [ndí- **cha** -tora] [Shona]
 1.SG.PST- AUX 1.SG.PART- PROG -take]
 ‘I was taking’ (Aranovich 2015, p. 55)
- e. au [a -gaukala -**ni**] [Balawaia]
 I 1.SG -work -CONT
 ‘I am (still in the process of) working’ (Kolia 1975, p. 133)
- f. män [[gattʃ -**adɔ**ʔay] ∅ -äm] [North Azeri]
 1.SG run -PROSP -PRS -1.SG
 ‘I am going to run’ (Davis 2014, p.22)

The following table, Tab. 5.9 provides a list with all the morphological distinctions that are made in the languages in the sample that have viewpoint aspect. The table is organized according to the amount of distinctions that are made. Thus, the first rows include languages that only have one overt distinction, the second group makes two overt distinctions, and the third group three distinctions.¹⁶

¹⁶Evenki might be one exception where the habitual behaves differently from the imperfective and perfective. However, this language also behaves differently with regard to how many past tense and future distinctions it makes, and at this point it is not clear what the tense/aspect system is in Evenki.

	IPFV	PFV	HAB	PROG	CONT	PROSP
Finnish	✓					
Semelai	✓					
Lavukaleve	✓					
Barai	✓					
Kalaallisut			✓			
Selepet			✓			
Kinande				✓		
Ndebele				✓		
English				✓		
Japanese				✓		
Albanian	✓	✓				
Armenian, East	✓	✓				
Greek	✓	✓				
Italian	✓	✓				
Nivkh	✓?	✓?				
Shona				✓	✓?	
Mosetén			✓	✓		
Hindi	✓	✓	✓			
Evenki	✓	✓	✓			
Nez Perce	✓	✓	✓			
Sahaptin	✓	✓	✓			
Malayalam	✓	✓		✓		
Kham	✓	✓		✓		
Basque	✓	✓				✓
Archi	✓	✓				✓
Balawaia		✓	✓?		✓?	
Urarina		✓	✓		✓?	
North Azeri		✓		✓		✓
Turkish?		✓		✓		✓
Latin?						

Table 5.9: Overview of viewpoint aspect distinctions

The languages differ greatly with respect to which distinctions are encoded. Already in case of the first group, where only one distinction is overtly marked, it can be the progressive, imperfective, or the habitual. Note that none of the languages mark the perfective as the sole distinction, nor the prospective. It has been observed that cross-linguistically the perfective is more often unmarked than the imperfective (Comrie 1976, Dahl 1985, Coon 2010). The question marks for some of the classification is here because it is at this point not possible to determine if these markers are

viewpoint or lexical aspect.¹⁷

With this variation in mind, it is now possible to turn to the relation between viewpoint aspect and encoding of higher categories. It is possible to distinguish three type of languages, exemplified in (62). The first one, Malayalam, cannot combine anything on the verb after viewpoint aspect; Greek is an example of the second group where tense and aspect can be combined on the verb, but markers like future cannot. Finally, a language like Latin can combine at least three categories on the verb.

- (62) a. [kan-**unnu**] [undaayirunn -**u**] [Malayalam]
 see-IPFV be -PST
 ‘I was seeing’ (Swenson 2017, based on p.110)
- b. [**é** -**tro** -a] [Greek]
 PST -eat.IPFV -1.SG.PST
 ‘I was eating / I used to eat’ C. Christopoulos, pc.
- c. laud -a -**u** -i -s -s -e -mus [Latin]
 praise -TV -PRF -TV -PST -SUBJ -TV -1.PL
 ‘We would have been praised’ (Embick and Halle 2004)

Table 5.10 lists all the languages according to which other features they can combine with on a single verb-word. This means that the order of languages is different in Table 5.10 than in the table above, 5.9. The three groups correspond to the examples in (62). The notation is as follows: **X** means that the category cannot be combined with viewpoint aspect, **✓** indicates the category can be combined with a category, and n/a refers to the fact that this category is absent in the language.¹⁸

¹⁷For example, Balawaia is listed both in the section on lexical aspect as having a resultative and a continuous marker, and listed here as well. The same can be said for the continuous marker in Barai, where the status is unclear.

¹⁸? and open spaces need to be investigated still in more detail

	with T	with Fut	with Mod	with Mood
Japanese	✗	n/a	n/a	✗
Kinande	✗	✗	(n/a?)	✗(n/a?)
Ndebele	✗	✗	(n/a?)	✗(n/a?)
Shona	✗	✗	(n/a?)	✗(n/a?)
Balawaia	n/a	✗	n/a	✗
Albanian	n/a?	✗	✗	✗
Semelai	n/a	✗	✗	✗
Finnish	✗	n/a	✗	✗?
English	✗	✗	✗	✗
Hindi	✗	✗?	✗	✗
Lavukaleve	✗	✗	✗	✗
Mosetén	✗	✗	✗	✗
Urarina	✗	✗	✗	✗
North Azeri	✗	✗	✗	✗
Turkish	✗	✗	✗	✗
Malayalam	✗	✗	✗	✗
Basque	✗	✗	?	✗
Archi	✗	n/a	?	?
Selepet	✓	✗	✗	✗
Armenian, East	✓	✗	✗	✗
Greek	✓	✗	✗	✗
Italian	✓	✗	✗	✓?
Evenki	✓?	✓?	✗	✗
Nivkh	n/a	✓?	✓?	✗
Kalaallisut	n/a	✓	✓	✓
Latin?	✓	✓	✓	✓
Kham	n/a	✓	✓	✓
Nez Perce	✓	✓	✓	✓
Sahaptin	✓	✓	✓	✓

Table 5.10: Viewpoint combined with other affixal morphemes

First of all, note that no distinction is made between different types of viewpoint aspect markers: whether a language has one, two, or three distinctions, all of them behave the same with regard to the higher categories. Thus, in the group where no combinations of viewpoint aspect and higher categories are possible inside the same verb-word, there are languages that make just a single morphological aspectual distinction (Semelai, Ndebele, English, Japanese), languages that make two distinctions (Albanian, Mosestén) and three distinctions (Turkish, Basque, Archi). Moreover, all these languages have at least progressive or imperfective marking. For the second group, consisting of only four languages, 3 languages make a two way distinction between perfective and imperfective, and only Selepet makes a one-way morphological contrast and has a habitual morpheme. The final group of languages also has languages that make only a single distinction (Kalaallit), a two way distinction (Nivkh), or three-way.

Thus, at this point it is not possible to form a generalization over which features do or do not lead to periphrasis. The languages where viewpoint aspect is always the last morpheme of the verb-word, group 1, all languages have at least progressive or imperfective marking. However, it is not possible to form a generalization that is of the form ‘if a language has category x, there is periphrasis’. It is possible to relating this back to the previous chapters, where I have argued following Aelbrecht (2010), Harwood (2013, 2015), Aelbrecht and Harwood (2015), Wurmbrand (2017) that aspect can be part of the first phase. All languages in the first group, where nothing follows viewpoint aspect can be accounted for with this proposal: the cut-off point for word building is the first phase, which includes viewpoint aspect. However, this proposal does not necessarily distinguish between the type of aspect. Harwood argues specifically it is the progressive that introduces a phase, but this is because he only looks at English, a language where there is only a progressive viewpoint aspect marker. Crucially, it must mean that these languages have head movement after spell-out.

Moreover, if that is the case, it raises the question why this phase boundary does not play a role in the second and third group of languages. One option I offered in the previous chapters is related to the type of head movement the language possibly has. That is, in a language like English or Japanese the verb never moves to T, whereas it does in Italian or Greek, (63), and in the latter

languages (specifically Greek) there is independent evidence for this type of movement. Data for English, Greek, and Italian is repeated below to show differences with regard to verb and adverb order.

- (63) a. Scary Spice ✗{ kisses } often ✓{ kisses } Baby Spice [English]
- b. Itan safes oti to pedhi **ekapse** **epitidhes** ti supa [Greek]
It.was clear that the child burned.3SG intentionally the soup.ACC
'It was clear that the child burned the soup intentionally'
- c. Topo Gigio **parla apposta** con un accento napoletano [Italian]
T. G. speaks intentionally with an accent neapolitan
'Topo Gigio intentionally speaks with a Neapolitan accent' (from Schifano 2015, ch2,8)

I argued that this step of head movement which is available in Greek and Italian, but absent in English, could feed into the word-formation process, which could then include tense and aspectual morphology inside the same verb. The same rationale can be used for Latin, a language which, despite its relatively free word order, has been tested with regard to verb height (Danckaert 2017). It has been argued, based on the order of negation and scope that the verb in fact moves to a position above tense, somewhere in the mood domain. That is, despite seemingly free word order, there are a couple of word orders that are absent, and Danckaert (2017) shows that this follows if the verb ends up in a high position in the clause. Interestingly, Latin can include aspect, tense, and mood inside a single verb, (64).

- (64) laud -a -**u** -i -s -s -e -mus [Latin]
praise -TV -PRF -TV -PST -SUBJ -TV -1.PL
'would we have been praised' (Embick and Halle 2004)

In this sense Latin is then similar to Greek and Italian, in that it includes head movement to a position in the inflectional domain, past the first phase. The difference is that in Latin the verb ends in a higher position than in Greek, and as such it also includes mood inside the verb-form. That is, even though these languages look like counterexamples to the phasal approach to word-building, these languages have an operation that is timed differently in the syntax which may obscure this effect. This additional operation, head movement or phase sliding, has been proposed independently

to account for various other properties. The observation made in the previous chapters was that this operation might also shed light on the variation found in word-building and the difference between Japanese/Turkish and languages like Greek.

It is possible to account for the other languages that have tense and aspect (and modality/mood) inside a single verb form. However, at this point this would be a stipulation since more in depth work is needed to see if there is in fact similar type of head movement in these languages. Unfortunately all languages in this sample are SOV languages (Selepet, Evenki, Armenian), or languages which have relatively free word order (Kalaallisut, Nivkh, Kham). Thus, in order to test what type of head movement is available in these languages, in-depth research of the type that was done for Japanese in chapter 2 and 3 is required. This is at this point not possible, since only grammar descriptions are available for these languages. However, what the system proposed in the previous chapters predicts is that these languages behave differently from Japanese and Turkish with regard to the identity requirement on the verb, if the languages allow for verb stranding verb phrase ellipsis. That is, the languages in the sample, even though they are head final, should pattern with Greek. If it is the case that, like for Japanese and Turkish in chapter 2, there are in fact phonological and syntactic tests that pick out a smaller unit, i.e. the unit including the verb and aspect but not tense, we should expect the languages to pattern unlike Greek.

A different consideration of the variation in the sample is by looking in more detail at the nature of the aspectual, tense, and modality marking. As noted in the beginning of the chapter, Sec. 5.1.1, I mentioned that labeling of the morphemes was decided based on the available literature and the context in which the morphemes occur. However, classifying the languages in this manner only gives a rough distinction. As noted in the literature (Comrie 1976, Arregui et al. 2014, Cinque 2017) there are in fact various flavors of (im)perfectivity across languages, which I could not always include in the sample, because it requires various semantic tests. As an example, consider the same examples in English (65) and in Italian (66). Both languages have a construction that is glossed progressive (*is x-ing* in English and *sta x-part*), but they differ for which readings are available.

- (65) a. He was being interrogated by the police [English]
 b. He is being naughty
 c. They have been fishing for three hours
 d. The book is lying on the table
 e. She is living in Texas
 f. She is always drinking whisky
- (66) a. *Lui stava essendo intervistato dalla polizia [Italian]
 he PROG being interrogated by.the police
 b. *Lui sta essendo cattivo
 The PROG being naughty
 c. *Loro sono stati pescando per 3 ore
 they have PROG fish for 3 hours
 d. *Il libro sta giacendo sul tavolo
 the book PROG lying on.the table
 e. *Lui sta vivendo in Texas
 he PROG live in texas
 f. *Lui sta sempre bevendo whisky (Cinque 2017:539)
 he PROG always drink whisky

These differences can have multiple reasons: either the label should be adapted in one of the languages, or there is a core meaning which is the same in both languages, but the interaction with other categories is different for each language, or, it could of course be that the difference is purely syntactic. In any case, in English the progressive can have both imperfective and progressive meaning (Comrie 1976), whereas Italian has both meanings marked grammatically. Of course, this requires an investigation for all of the languages in the sample: what is needed is to see if the languages that have tense and aspect in the same syntactic word have a unifying element where meaning is shared, and this element is absent in the languages that cannot combine tense and aspect, i.e. are like English.

In this sense it is important to compare categories in a single field, i.e., specific differences in viewpoint aspect, but it is also important to investigate these features in combinations with features from other fields: that is, what is the nature of tense and mood/modality? There are six languages in

the sample that do not have overt tense in their morphological paradigm; three of them can combine viewpoint aspect with higher categories (Nivkh, Kham, Kalaallisut) and three cannot (Semelai, Albanian, Balawaia). The first three do have other characteristics, in that they can express arguments inside the verb-word, whereas the others do not. As mentioned, the category of mood and modality can consist of various different labels (cf. Palmer 2001) and I leave open the research for what possible interactions are available between a specific mood system and tense system.

5.2.2.3 Perfect

The last aspectual category that I discuss is the Perfect. Again, there are various ways this category can be expressed. It can be only affixal, as is the case in Nez Perce (67a); periphrastic (67b as in Evenki; or it can alternate, as in Turkish (67c) where the perfect morphology can be expressed on the verb, or as an auxiliary in case there is viewpoint aspect morpheme.

- (67) a. [híp -s] [Nez Perce]
 eat -PRF
 ‘I have (just) eaten’ (Crook 1999, p. 98)
- b. Nungan ulle-ve [loko -cho] [bi -che -n] [Evenki]
 she meat-ACC.DEF hang -PART AUX -PST -3.SG
 ‘She had hung the meat’ (Nedjalkov 1997, adapted p. 246)
- c. i. Kedi farey [kovala -miş] [(i -di)] [Turkish]
 cat mouse chase -PRF AUX -PST
 ‘The cat has (had) chased a mouse’
- ii. Kedi farey [koval -iyor] [ol -muş] [(i -di)]
 Cat mouse chase -PROG AUX -PRF AUX -PST
 ‘The cat has (had) been chasing a mouse’

The overview of these three different language types is summarized in table 5.11. Note that, apart from the three ways of expressing this feature, there are also various languages that lack this category as a grammatical encoding.

[V-x]	[V] [x]	[V-x] or [V] [x]	No x
Ndebele	Evenki	North Azeri	Semelai
Japanese	Basque	Turkish	Kalaallisut
Nez Perce	Malayalam	English	Hindi
Sahaptin	Albanian	Latin	Nivkh
Barai	Greek		Balawaia
Yareba	Italian		Lakuvalele
	Archi		Selepet
	Kham		Mosetén
	Newar		Urarina
	Finnish		Shona?
	Ömie		Kinande?

Table 5.11: Distribution of Perfect morphemes

Observe that this marker has a different, much more mixed distribution than the other categories discussed so far. To make the variation less: the third type of language, that has alternating morphology, is in its basis affixal, since these perfect markers cannot combine with any other aspectual marking (North Azeri, Turkish, English) or the passive (Latin); an example is Turkish in (67c) above. This leaves us with two types of perfect marking. For the first group it is important to discuss which affix combinations are possible. As will become clear, it is not the case that all type of morphology can follow or precede this marker. In this sense it is different from other affixal marking, where there were less restrictions.

The first point relates to the languages in the first column. None of these languages can combine the perfect with tense material. Either this is done via an auxiliary (as in Japanese), or all the tense information comes from the perfect. For example, in Nez Perce (67a) it is not possible to combine the perfect marker with any tense marker (remote past, habitual past or recent past). With regard to viewpoint aspect, there seem to be restrictions as well. This means that, combined with the languages in the third column, that when a language has a functional morpheme that expresses the perfect, it cannot combine with tense morphology on the same verb-word, and there are restrictions with regard to viewpoint aspect as well.

This second observation has to do with the languages in the second column. Generally, the perfect is expressed in a higher position than viewpoint aspect. An example is is Greek where,

when the past is expressed on the verb, there is a simple past reading, but when it is expressed on an auxiliary, (68b), there is a perfect reading, even though there is no perfect morphology (the verb does show up as a participial). A different example is Evenki, repeated from (67b) where the past can be expressed on the verb, but when there is a perfect, the past is expressed on a dummy auxiliary and the verb has participial morphology, (69). Evenki is in this sense very similar to English.

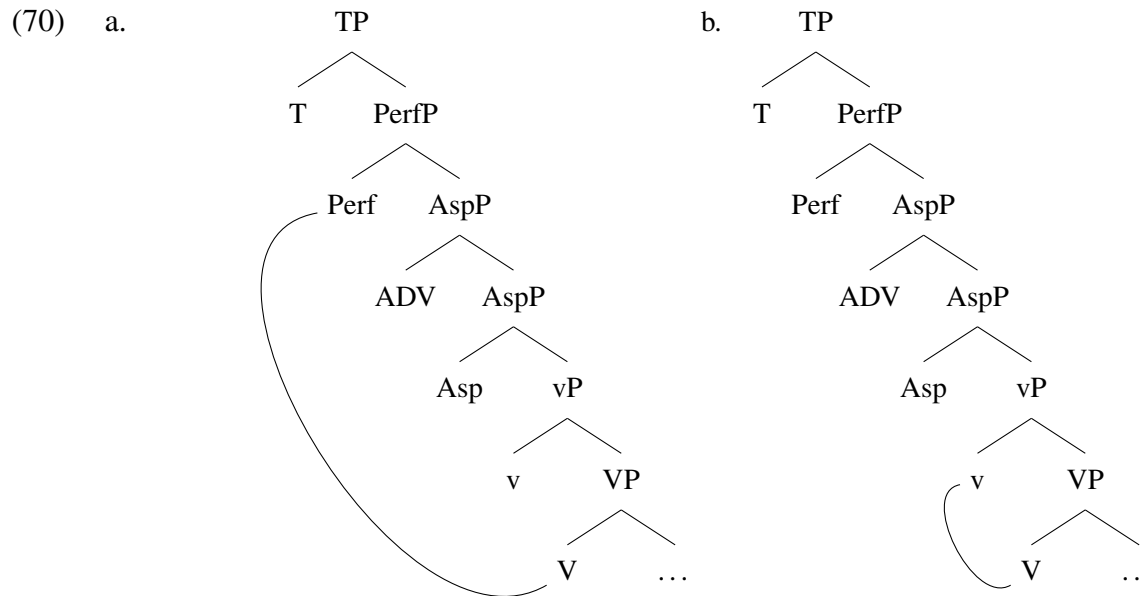
(68) a. [e- γrapsa] [Greek]
 PST write.PFV
 ‘I wrote it’

b. [ixa] [γrapsi] [Greek]
 PST.AUX write.PFV
 ‘have written’ (Roussou and Tsangalidis 2010, p.48)

(69) a. Eni [eme -che -n] [Evenki]
 mother come -PST -3.SG
 ‘Mother came’ (Nedjalkov 1997, p. 239)

b. Nungan ulle-ve [loko -cho] [bi -che -n] [Evenki]
 she meat-ACC.DEF hang -PART AUX -PST -3.SG
 ‘She had hung the meat’ (Nedjalkov 1997, adapted p. 246)

This pattern where the perfect is generally periphrastic is also found in the studies of Bybee (1985), Dahl (1985) and Bybee and Dahl (1989), namely in their language samples the perfect was in most cases expressed periphrastically. In previous chapters I have shown that even though Greek and English differ with respect to the combination of viewpoint aspect and tense morphology inside a single verb, both languages do have a periphrastic construction for the perfect. Moreover, there is a difference between these languages, in that in Greek the participial verb form ends up in a higher position than in English, which I argued was due to the fact that the verb in Greek moves to the perfect head, but in English the verb remains lower, (70). Crucially, I assumed, as also discussed above, that there is a dedicated head for the perfect.



Thus in both languages the perfect, whether expressed with perfect morphology or not, can attach on the verb. However, I argued that in Greek, because the Perfect is the first head outside of the phase, no other material can attach to it. This means that the past needs to be expressed as an auxiliary. Thus, both Greek and English have T be expressed as an auxiliary, the source of this is different, because in English the verb and perfect move at a later point to form a verb-word.

To summarize, I have shown that aspect, based on their morphological behaviour, can be split up in three types, which are also found in semantic descriptions in the literature (as discussed in Sec. 5.1.2): lexical aspect, viewpoint aspect, and the perfect. The features in the extended projection of the verb that refer to lexical aspect can either be a root or a functional morpheme. When they are roots, they can occur in periphrastic constructions (restructuring contexts), but they never participate in periphrasis when they are a bound morpheme. In that case the feature is always expressed as an affix on the verb. Viewpoint aspect on the other hand is most often expressed as a bound morpheme, hosted by the verb. But, different than with lexical aspect, it can be the end of the syntactic verb word. I have shown that there is variation in this regard, and the next steps are to investigate the categories in more detail and the syntactic reflexes of head movement. Finally, the perfect can be expressed in a periphrastic construction without a dedicated perfect-morpheme, or it can be

expressed as a bound morpheme. In the latter cases it can generally not combine with viewpoint aspect or tense on the verb, which requires periphrastic constructions or there are limits to the tense interpretation. Finally, for both viewpoint aspect and lexical aspect all features in these categories in a given language pattern the same: either they all participate in periphrasis or they do not.

5.2.3 Tense

The discussion of tense is split up into two sections: one on the past/present distinction, and the other section focuses on the future. As mentioned in section 5.1.2.3 the future shares properties with modality rather than tense, but since it is descriptively mentioned most of the time as a tense morpheme, I discuss it here. As will become clear, the morphological reflexes of past and present are very different from that of the future: indeed the expression of future is more similar to that of modality markers discussed in the next section, 5.2.4. That is, past/present morphology is always expressed as a bound morpheme that needs a host and this morpheme alternates the most between affixal and periphrastic constructions of all the categories discussed so far. The most common alternation is that of (71a) where the tense morpheme is affixal without aspect, but periphrastic with aspect in Malayalam. I discuss other cases in more detail below. For the future there is more variation, an example is given in (71b) for Hindi as an affixal morpheme. However, there are various restrictions with regard to possible combinations, even when the future is affixal. Moreover, in case of the future, there are often complementation structures, which require infinitival morphology. This is never the case with past/present marking.

- (71) a. i. [vann -u] [Malayalam]
 come -PST
 ‘he came’ (Swenson 2017, p. 79)
- ii. [kan-**unnu**] [undaayirunn -u] [Malayalam]
 see-IPFV be -PST
 ‘I was seeing’ (Swenson 2017, based on p.110)
- b. vəh [khāe -g -a] [Hindi]
 he eat -FUT -3.SG
 ‘He will eat’

The overarching pattern that arises is the following. The future constitutes a very mixed group. Many languages do not have a future, but instead use a modal. When the languages do express future, this can be done with a bound morpheme or a root in a complementation structure. When they are bound morphemes they generally pattern with past and present in that they need to be expressed periphrastically. Past and present, are always expressed as a bound morpheme that needs a host, and it is the one category where there is the most variation whether this host is the main verb, or a dummy auxiliary. The latter is needed in case of specific feature combinations, as also discussed in the previous sections for viewpoint aspect and tense.

5.2.3.1 Past/Present

Past and present Tense is used to encode the relationship between the time a sentence is uttered and the event (Reichenbach 1947, Comrie 1985, Kamp and Reyle 1993, Klein 1994, Smith 2007): past tense refers to the event having taken place before the utterance time, whereas present tense refers to the utterance time and the event being at the same moment. As discussed for other categories before, there are roughly speaking three options to express this category: as a suffix, exemplified for Nez Perce (72a); always on a dummy auxiliary, shown for Archi in (72b), or it can alternate being expressed on the main verb or with a dummy auxiliary, as shown for Malayalam, (72c).

- (72) a. [hip -**see** -**qa**] [Nez Perce]
 see -IPFV -R.PST
 ‘I was seeing’ / ‘I saw’ (Crook 1999, p.113)
- b. doba-mu mu:ši k’ob [a -**r** -**ši**] [**edi**] [Archi]
 grammy-SG.ERG well clothes.PL.ABS do -IPFV -CVB be.PST
 ‘(My) granny made good dresses.’ (was a good seamstress) (Chumakina 2013, p.35)
- c. i. [vann -**u**] [Malayalam]
 come -PST
 ‘he came’ (Swenson 2017, p. 79)
- ii. [kan-**unnu**] [undaayirunn -**u**] [Malayalam]
 see-IPFV be -PST
 ‘I was seeing’ (Swenson 2017, based on p.110)

Each option is an example of multiple languages in the sample. The overview is given in Tab.

5.12. The fourth column gives the languages that do not have a past/present distinction. These languages generally use aspectual distinctions, or only have future/modality marking, which is discussed in the following section. The first column consists of languages that always express tense as an affix, the second column consists of languages where tense is always periphrastic, and the third group consists of languages where tense morphemes alternate between affixal or periphrastic.

[V-x]	[V] [x]	[V-x] or [V] [x]	No x
Nez Perce	Archi	Kinande	Semelai
Sahaptin	Mosetén	Ndebele	Kalaallisut
Balawaia	Urarina	Shona	Nivkh
Selepet		North Azeri	Kham
Barai		Turkish	Newar
		Evenki	Lavukaleve
		Basque	
		Malayalam	
		Albanian	
		Armenian, East	
		English	
		Greek	
		Hindi	
		Latin	
		Italian	
		Japanese	
		Finnish	
		Ömie	
		Yareba	

Table 5.12: Distribution of Tense morphemes

In order to understand this pattern better, several points require explanation. First of all, it is important to understand the third group of languages, where tense morphemes alternate between being part of the verb-word or not. Most of these languages have been discussed with regard to viewpoint aspect and the perfect already, but since the focus is here on tense, additional information will be given. That is, most of the languages cannot combine tense and viewpoint aspect, but as discussed in section 5.2.2.2, there are some languages where this is possible. Second, it is important to discuss which other features can combine with the tense morphemes. Especially with regard to the affix-only languages, there are various restrictions on tense-aspect combinations.

The third and second group in Table 5.12 follows by putting the data from the previous sections together: one group of languages cannot combine viewpoint aspect and tense inside a single word, and the second group can, but has auxiliaries for the perfect, in which case the verb form is expressed as a participle.

(73) Aux-T with viewpoint Aspect and perfect:

Kinande, Ndebele, Shona, Nort Azeri, Turkish, Basque, Malayalam, Albanian, English, Hindi, Japanese, Finnish, Archi, Mosestén, Urarina

(74) Aux-T with perfect only:

Armenian, Greek, Italian, Ömie, Yareba

The latter group of these languages can be split into two: the first three languages allow viewpoint aspect and tense inside a single syntactic head, the latter two (Ömie and Yareba) lack viewpoint aspect all together. Moreover, as discussed, Greek and Italian have evidence of verb movement to Tense, and this still has to be determined for Armenian.

There are only 5 languages where tense is always an affix, those that are listed in the first column in Table 5.12. There are several observations to be made about Nez Perce and Sahaptin on the one hand and Balawaia and Barai on the other hand. All these languages have viewpoint aspect morphology, and as such they pattern with Armenian, Greek and Italian. However, there are some differences. First of all, for Barai it is not clear in the grammar if it is possible to combine imperfective (labeled continuous marking) with past or present marking. The only examples that are given are for one or the other option. The markers are described as occurring in the same ‘slot’ on the verb, but it is not clear how an imperfective past is expressed in this language.

Balawaia has a system to indicate tense that is slightly different, and might even be not a tense system as discussed for various other languages above. The marker that is labeled as present tense in the grammar can be combined with a continuous marker indicating that either the event is ongoing at the moment, or has just stopped, (75a). This marker can also be combined with a perfective marker to indicate an event in the past, (75b). There is a different set of agreement markers, that are

build of the present tense markers, to indicate definite non-present readings. These markers can be either translated as past, (76a), or as future, (76b).

- (75) a. [**a-** mamai **-ni**] [Balawaia]
 1.SG- laugh -CONT
 ‘I am laughing (now)’ or ‘I was laughing (just now, having only this moment stopped)’
- b. [**a-** bala **-to**]
 1.SG- dance -
 ‘I danced (at the feast)’ (p.153-154)
- (76) a. [**ba** -tagi]
 1.SG.NON.PRES -cry
 ‘I cried (a while ago)’
- b. au maki [**ba-** mari **-ni**]
 I certainly 1.SG.NON.PRES- sing CONT
 ‘I will certainly sing’ (Kolia 1975, p.154/6)

This data suggest that a distinction is made between a marker that references the present, and can indicate if an event has taken place relative to the present, (75), and a marker that indicates that an event is not taking place in the present, but can take place either in the past, or the future. There is a marker that is also indicating that is labeled as an indefinite non-present, and can also refer to the past or the future, based on different adverbials. These data require more study, especially with regard to how tense is encoded in this language. This in turn can shed light on the combination with aspectual markers in this language. A similar issue that cannot be resolved at the present moment arises in Nez Perce and Sahaptin, which have a system for tense that is also relative, i.e., past markers can refer to the close or distant past. The list of morphemes is given in (77) for Nez Perce.

- (77) a. HAB = *teetu*; IPFV = *see*; PFV = *ye/ne*
- b. PRF = *s/n*
- c. REC.PST = *qa*; PST.HAB = *qaaqa*; REM.PST = *ne*

The problem that needs to be resolved in order to understand what the nature is of tense and aspect is the following. From these markers, the perfective and the perfect can never combine

with any tense markers; the only combinations for tense and aspect are for the habitual and the imperfective. This is different from languages discussed before, where it is possible to combine the perfective with past tense marking, and also to create past perfects (pluperfect). In this sense these aspectual markers seem to compete with the tense system. Interestingly, these markers (PFV, PRF) have different order for number agreement: generally number is marked as a suffix in between aspect and tense, but in these cases number is marked as a prefix. That is, it is not clear if there are any phonological or morphological indications if this unit is always treated as a single syntactic unit or not and what, if any, type of head movement the language has.

5.2.3.2 Future

The future refers to an event taking place at a time past the reference time. Examples are given below where the future can be expressed always as an affix, as is the case for Hindi, (78); always preiphrastically as is the case for Albanian (78b), or the future can be both, depending on the context, as is the case in Ndebele (78c).

- (78) a. vəh [khāe -g -a] [Hindi]
 he eat -FUT -3.SG
 ‘He will eat’
- b. [do] [tē] [jem] [Albanian]
 FUT INF? be
 ‘I will be’
- c. i. [ngi- **za**- bal -a] [Ndebele]
 1.SG -FUT read FINAL.SUFF.
 ‘I will read’
- ii. [u -**za** -be] [u -bala]
 2.SG -FUT -AUX 2.SG -read.IPFV
 ‘You will be reading’ (Pietraszko 2017, p.15/16)

As before, all three languages exemplify a larger group of languages, summarized in Table 5.13.

[V-x]	[V] [x]	[V-x] or [V] [x]	No x
Kalaallisut	Basque	Ndebele	Semelai
Hindi	Albanian	Shona	Japanese
Nivkh	Armenian, East	North Azeri	Archi
Newar	English	Turkish	Finnish
Barai	Greek	Evenki	Kham
Ömie	Finnish	Malayalam	Nez Perce
Latin	Italian	Lavukaleve	Sahaptin
			Mosetén
			Urarina
			Balawaia

Table 5.13: Distribution of Future morphemes

First of all, observe that the group of languages that does not have a dedicated future morpheme is quite large. This is in fact in line with findings in other cross-linguistic studies (Bybee 1985, Bybee et al. 1994, Others). Many languages express the future via different types of modality marker, that is, markers that are also used for other readings as well. This could even be said for English for example, but for now I have it listed in the second group.

All languages where the future alternates are like Ndebele in (78c) in that it has a morpheme that expresses the future which can be hosted by the verb, but not when there are overt aspectual markers on the verb. The languages in the second group are mixed. For example, as shown for Albanian in (78b) there is in fact an infinitival marker present, which indicates that the future is part of a different structure than in languages like Ndebele. Thus, in this group there are languages where there is an embedded structure, and the future is expressed via a root like element, or it can be expressed via a periphrastic construction where the marker needs to be hosted by other material.

Finally, the languages where the marker is always an affix is also split in different groups. For Hindi, Newar, Barai and Ömie it is not possible to combine this marker with any other marker on the verb, and auxiliaries are needed. Latin, Kalaallisut and Nivkh on the other hand can combine the future with other markers, as was also discussed in the section on viewpoint aspect. One option which is not explored here is if all the markers for the future are in fact future markers, or if they are instantiations of the prospective aspect. If that is the case, it might change the picture presented in table 5.13.

5.2.4 Mood and Modality

Finally, the only group of features that is left is Mood and Modality. As noted in Sec. 5.1, this group is complex. As pointed out in Sec. 5.1.2.4, a distinction can be made in what type of mood system a language has, and with regard to modality a split can be made between propositional and event modality. However, when going through the grammars, these subtle distinctions are not always possible to make, and the required context to determine what category a certain morpheme belongs to is in these categories less easy to determine than for the previous categories. To this end, I leave this section open for now, and only make a couple of remarks.

First of all, some examples are given in (79): Descriptively, obligation can be marked inside the word with the main verb in Kalaallisut, (79a); it can be expressed as a clitic, as exemplified for the subjunctive mood in Greek, (79b); and sometimes the morpheme can be expressed on the main verb and sometimes on an auxiliary, as is the case for the conditional in Turkish, (79c).

- (79) a. [imir -niru -**sariaqar** -putit] [Kalaallisut]
 drink -more -must -2.SG.INDIC
 ‘You must drink more’ (Fortescue 1984, p. 292)
- b. [na] [e- γραψα] [Greek]
 SUBJ PST write.PFV
 ‘I should write it’ (Roussou and Tsangalidis 2010, p. 48)
- c. i. [kal -**sa** -niz] [Turkish]
 stay -COND -2.PL
 ‘If you stay’
- ii. [kal -**di**] [i -se -niz]
 stay -PST AUX -COND -2.PL
 ‘If you have stayed’ (based on Kornfilt 1997)

These three options for expressing mood and modality are summarized in table 5.14, where the first column corresponds to languages where these markers are always expressed as an affix, the second column to languages where these markers are expressed periphrastically, and the last column to languages where these categories can be expressed either as an affix or in a periphrastic construction.¹⁹ Note that in this case no distinction is made between any type of system and any

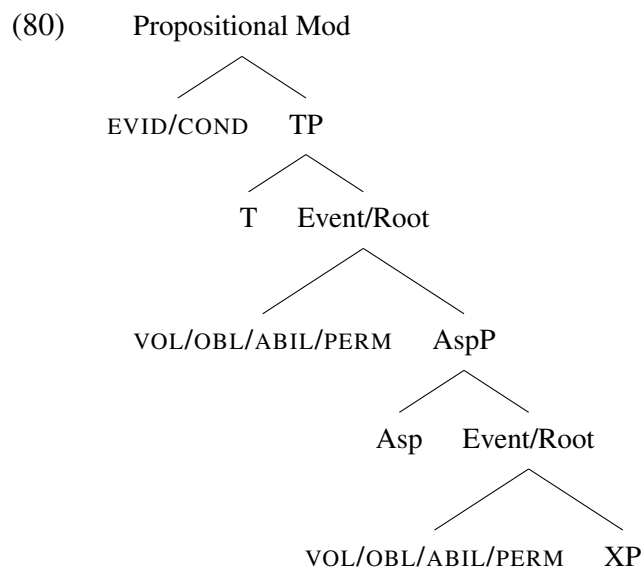
¹⁹Languages missing: Archi, Shona, Ndebele, Kinande, Italian.

type of modality.

[V-x]	[V] [x]	[V-x] or [V] [x]
Kalaallisut	Semelai	North Azeri
Nivkh	Armenian, East	Turkish
Kham	English	Evenki
Nez Perce	Greek	Malayalam
Sahaptin	Barai	Japanese
Ömie?	Mosetén	Newar
Yareba?	Ömie?	Balawaia
	Hindi	Lavukaleve
		Selepet
		Urarina
		Latin

Table 5.14: Distribution of Mood and Modality morphemes

At this point, this table is not yet that informative since no split is made between different categories, nor between how these categories are expressed (as free or bound morphemes). The one point that can be made at this stage is the following, with regard to the hierarchical structure. I presented in Sec. 5.1.2.4 the following structure for possible locations of Mood and Modality categories:



Under the approach taken here, I argued that Viewpoint aspect acts as a phase head. If head movement is available on the first phase, it should only stop when it finds the phase head (or can

move past it in case of head movement being timed before phasal material is sent to the interfaces). Crucially, it should not stop for any material below the phase. Thus, categories such as lexical aspect and valency changing morphology (except for the passive) should always be included in the verb-word. In the literature on Modality, there seems to be consensus that the location of Event or Root modality can be below tense, and in some cases below Aspect. The prediction is thus that when a language has event modality below aspect, and the category is expressed as a bound morpheme, it should never participate in periphrasis. Thus, a morpheme like *abil* in Turkish, when it is expressed below viewpoint aspect, patterns according to this pattern, and in this case it expresses ability modality. Mood categories on the other hand are expressed as an auxiliary, even outside of tense (79c-ii). I leave testing this prediction in more detail open for future work.

- (81) [oku -yabil -iyor -um]
 read -ABIL -PROG. -1.SG
 ‘I am being able to read’

(Kornfilt 1997, p.374)

5.3 Generalizations over the whole domain

To summarize, I have discussed different groups of inflectional features with regard to their morphological behaviour and the possibility to combine with different features inside a single syntactic word. First of all, I discussed various strategies to mark inflectional categories, and there were three main types: inflectional categories can be expressed as roots, as bound morphemes, or there can be a periphrastic construction where there is no dedicated morpheme to express that particular category. With regard to the first type, where an inflectional category is expressed as a (semi)-lexical item, it mostly occurs with the causative, lexical aspect, and the future and (modality). The last type, where there is no dedicated morpheme only occurs with the passive: In this cases there is a dummy auxiliary which host viewpoint aspect or tense, which is similar to the periphrastic constructions with bound morphemes, but the verb carries participial morphology. Finally, inflectional categories that are expressed as a bound morpheme requiring a host occurs with all categories; however, only valency changing morphology and lexical aspect never occur on a dummy auxiliary. This is

summarized in (82).

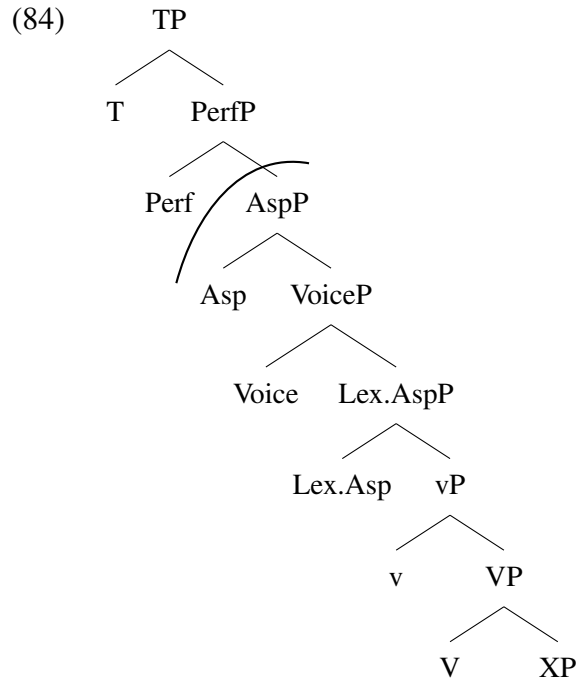
- (82) a. $\sqrt{V} \sqrt{V_x} \sqrt{V_y}$: Lexical Aspect, Causative, (Modality, Mood) [Root]
 b. i. $[\sqrt{V} x -y]$: All categories [bound Morpheme]
 ii. $[\sqrt{V} -x]$ [AUX-y]: Viewpoint Aspect, Perfect, Tense, Future, Modality, Mood
 c. $[\sqrt{V} -PART]$ [AUX-y]: Passive [Other]

Crucially, lexical aspect and valency changing morphology do not have periphrastic constructions other than the root combinations: That is, when these categories are expressed as a functional morpheme that needs a host, they are always affixal and never part of an auxiliary, this is repeated in (83).

(83) *Generalization I*

When *v*, Valency changing morphology, and Lexical aspect are expressed as bound morphemes, they do not participate in periphrasis

This is surprising considering that there is no a priori reason for these categories to be always expressed as an affix on a verb, rather than hosted by a dummy auxiliary. In many descriptions or classifications, these categories are described as ‘derivational’ rather than ‘inflectional morphology’. As has been pointed out in Pietraszko (2017) for Ndebele, only inflectional features seem to play a role in periphrasis. The question remains how this is encoded in a language. One way to do this, without invoking lexical features that classify a morpheme as [+/-inflectional] is with the proposal made in this dissertation: domains. Let us see how that falls out. The hierarchical structure for a hypothetical clause is given in (84), with the phase boundary as argued for in the previous chapters between Aspect and the Perfect. Second, I assumed that if a head needs to be an affix, it needs to have a host, which can be either done through movement or through auxiliary insertion.



- (85) affix Constraint: $*[AFF]_{x^0}$
- a. movement: $[V\ AFF]_{x^0}$
- b. Auxiliary insertion: $[AFF]_{x^0} \Rightarrow [AUX\ AFF]_{x^0}$

If there is movement in the first domain, either it can happen before spell-out, in which case it can combine immediately with heads from the higher phase. This was tested with regard to languages that have V-to-T movement in Ch. 3 and can also account for the data for languages like Latin, Armenian or the Sahaptian languages. What remains to be tested is if these languages have independent evidence for this timing for movement in the syntax. If movement happens after spell-out, the phase boundary blocks movement in the syntax. Thus, in these type of languages, tense and viewpoint aspect can never combine inside a single head. Even though I stipulated in Ch 3. that head movement does not take place in the second phase, I discussed various options for my this might not be possible at all. First of all, I discussed that head movement is only possible with roots, following Cinque (2005). Thus, this means that if the complex head is spelled out on the first phase, the higher heads cannot move anymore because they do not have a root. Only at a later stage does the auxiliary get inserted, at which point head movement is not available anymore. Second, I also gave a direction to derive that movement is not possible anymore when the complex head is not yet spelled out on the first phase. This had to do with the morphological operation of removing unmarked heads and docking material onto higher heads to create feature bundles

(following Calabrese 2019). If that operation holds, it means that only a single step of movement is possible whenever the complex head in the first phase is not yet spelled out. Thus, the proposal made in Ch. 2 and 3. can then explain the pattern discussed in this chapter. Heads in the lower domain do not participate in periphrasis, since, when they are bound morphemes, the only operation that is available is head movement. Heads in the higher domain can differ, depending on the timing of movement in the syntax, and the nature of the morpheme (bound or free)

Second, languages can make various distinctions per category, which are summarized and repeated in table 5.15. I have discussed these features for each of the fields in the previous sections.

Field	Category
<i>v</i>	class, theme vowels, verbalizers
valency changing	CAUS, APPL, BENEF, INCH, MIDDLE, RECIP, REFL., AP
Lexical Aspect	INGRESS, INCEPT, PUNCT, SEMELF, REP, CONT, RES. TERM.
Voice	PASS, ACT
Viewpoint Aspect	IMPF, PFV, HAB, PROG, CONT PROSP
Perfect	PRF
Tense	PST, PRES, FUT
Modality	ABIL, NEC, OBL, EVID, COND, VOL, PERM
Mood	IMP, SUBJ, INDIC, IRR

Table 5.15: Overview fields and categories

Interestingly, for the lower heads all behave the same in a single language (and heads in the higher domain, specifically for the different modality and mood distinctions still have to be tested in more detail). That is, in a given language there can be a difference between certain categories being expressed as roots and others not, but all features that are expressed as roots or as bound morphemes all behave the same, this is repeated in (86). This generalization holds for the lower heads, but might also hold for mood and modality categories once those is sorted out in more detail.

(86) *Generalizaiton II*

All features expressed as bound morphemes in a single category in a given language behave the same with regard to periphrasis

Again, this generalization could be different as well: it is entirely possible that a language would make a distinction between different types of valency changing morphology. Especially

in frameworks where each feature is expressed in a different head/phrase (Cinque 1999) or in approaches where periphrasis is the result of morphological constraints or markedness features (Bjorkman 2011, Calabrese 2019). Of course, this generalization should be taken with a word of caution: much more research is needed to make sure that this is a stable generalization. This is because many of these categories can be expressed as a different morpheme (i.e., a root), or this cannot be established at this point what type of morpheme they are. This leaves a smaller set of languages that show this generalization, but it is still a considerable group. Thus, this can be interpreted in two ways. Either it is the case that lexical aspect and valency changing morphology is in fact never expressed periphrastically, even though they are expressed as functional morphemes that need a host. If that is the case, the question is why these features do not participate in periphrasis in any way. On the other hand, if it is the case that all these categories can be reduced to these morphemes being always roots rather than bound morphemes, it is not the case that they can never participate in periphrasis. In this case, the question is why it is these categories that are generally expressed in this way, and why periphrasis with bound morphemes and dummy auxiliaries overwhelmingly occurs between tense and viewpoint aspect. That is, what makes viewpoint aspect and tense so special that, if head movement does not intervene, they cannot be expressed inside the same complex head.

Taking the approach taken here, that domains restrict syntactic word boundaries, it is not surprising that features in the lower domain do not play a role, since they are not at the edge of the syntactic phase. Viewpoint aspect is the only exception, and this is also the only case where there is an alternation between synthesis and periphrasis. However, it needs to be researched if this is due to independent parameters in the language such as head movement before spell-out of the verb to the second domain.

5.4 Conclusion

I have discussed cross-linguistic patterns of periphrasis and synthesis in 33 languages from 15 families and 3 isolates. Despite wide variation in these languages with regard to which categories can be expressed grammatically, and how these categories are expressed (as a bound or free morpheme), there are some interesting generalizations that arise, especially with regard to categories in the lower clausal domain. This means that despite this variation, there are in fact clear restrictions on what can and cannot combine. This is surprising, since much more variation could be expected considering the wide data sample. Establishing these generalizations by doing typological work opens up new avenues of research within these languages: under the hypothesis that synthetic and auxiliary patterns are not completely random but systematically follow from timing differences in word-building operations, several predictions can be made about the languages looked at here.

6

Conclusion

The overarching question dealt with in this dissertation is whether it is possible to maintain that a ‘word’ is a coherent unit of grammar, and, if that is tenable, what the consequences are for the mapping between the different components of grammar, specifically the relation between syntax and the form-side: morphology and phonology. I argued that in light of the data presented in this dissertation, it is possible to argue for the notion of a syntactic word, which can be defined in terms of phase hood. This syntactic word is mapped onto phonological units, but timing differences in when material is put together can create mismatches between components of grammar, hence obscuring the regularities. In order to explore these issues, I approached the problem from both a cross-modular and a cross-linguistic perspective. Here I discuss what the main findings of

the dissertation are, how these findings inform theories of mapping syntax to morphology and phonology, and point out various consequences for future work.

In order to explore the mapping between syntax, morphology, and phonology, and the unit of the word, I investigated various issues related to the verbal domain and the expression of Tense, Mood, Aspect, and Voice. First of all, I looked at mismatches between phonology and syntax: I investigated cases in Turkish and Japanese where different phonological processes pick out different word-units. I showed, first of all, that the phonological units that pick out a subset of the larger phonological word align with units that are picked out in the syntax. I argued that these smaller units are syntactic words, which can map onto phonological units. Moreover, I argued that the syntactic words are delimited by phases, and proposed that head movement is blocked by the phase head when it takes place after phasal material is sent to the interfaces. The fact that there can be phonological words that are larger than the syntactic words comes from timing differences when the relevant elements are put together, which in effect can partly obscure the underlying syntactic patterns. By showing this, I argue that it is possible to maintain that there is a unit that resembles a word, which is built in the syntax. Moreover, this result has implications for the post-syntactic component(s) of grammar, which potentially involves multiple operations that map syntactic structures and features to a phonological representation through a series of derivational steps. In order to support this conclusion, I did cross-linguistic comparison of a small set of languages. Doing this meant that it was possible to abstract away from language-specific properties and make generalizations that pertain to multiple languages.

The result of this investigation into a small group of languages was then explored in more detail in Chapters 3 and 4. I first explored the proposal that word-building consists of a single operation that puts units together, and that this mechanism can apply at various stages of the grammar. This then resulted in various surface patterns with regard to synthesis and periphrasis. The consequences of this approach were then tested by looking at different phenomena in the syntax, morphology and phonology, such as matching constraints on verbs and inflectional material in ellipsis contexts. I also indicated predictions made by the proposal here for other phenomena such as extraction

patterns in the nominal domain, suppletion patterns, mismatches in suffixes and prefixes, and vowel harmony patterns. Moreover, taking serious the idea that the different sizes of phonological words are in part built of syntactic units can inform theories at the interfaces as well; and the ideas presented here argue that word-patterns in a language can be indicative, and make predictions for the behaviour of other phenomena related to verbs and movement in a particular language.

Second of all, I explored the idea that phases regulate word-building. I followed approaches that assume that word-building can be delimited by phases, and tested this prediction by comparing phrasal phenomena that have been accounted for in domain approaches with the auxiliary patterns in a couple of languages. I showed that initial correlations can be established, by looking at fronting and ellipsis patterns in Japanese and English, and particle placement in Turkish and Japanese. Crucially, the boundary around aspect I argued for, following other work, in case of auxiliary patterns is visible in these phrasal phenomena as well. Even though many issues related to this remain open, if the large line of research that explores word-hood from a syntactic perspective is on the right track, it is important to explore these issues in more detail. Moreover, it means that word-hood patterns can in turn inform theories of phases, and make predictions about patterns we should find in phrasal phenomena such as ellipsis or fronting.

Finally, a large-scale typological study was conducted as well. The aim of this study was, first of all, to determine the (limits) of the variation of verbal single and multi-word expressions cross-linguistically. I showed that there are various regularities that are not necessarily expected if there are no limits put on word building mechanisms. First of all, I showed that when a morpheme needs to have a verbal host, valency changing morphology and lexical aspect morphology is never expressed on a dummy auxiliary. This stands in contrasts with morphemes like tense which when they require a verbal host, can be expressed on the verb or on an auxiliary when other (aspectual) features are expressed on the verb. I argued that this follows from the domain approach to word building put forward here: when head movement is available in a language, it starts with the verb root in the first domain and is only blocked by a phase head when it applies after material is sent to the interfaces. Second of all, the patterns found in the study show more variation with regard

to the tense, mood and modality domain. What is important is that on the one hand the result is that there is a more comprehensive descriptions of these patterns in a single place, and on the other hand, maybe even more interestingly, the result is that these patterns can inform us how to investigate these languages in more detail. Since I argue that the form of the verb and the amount of inflectional morphology that is present of the verb should be indicative of the type of movement that is available in the language, the patterns found in the study open up new avenues for researching specific languages in more detail, as was done for Turkish and Japanese in the previous chapters.

To conclude, despite all the surface variation in word hood, I show that there is more uniformity than initial appearances suggest in the expression of features as single words or periphrastic constructions, and that there may be universal aspects to the analysis. Furthermore, the apparent mismatches between phonological and syntactic tests for word-hood are in fact regular consequences of the relevant processes. Uncovering these facts point to the need for a more integrated approach to cross-modular and cross-linguistic research.

Bibliography

- Abe, J. (2019). Antecedent-contained deletion in Japanese: Support for the vp-ellipsis analysis. *Studia Linguistica* 73(1), 106–138.
- Abels, K. (2003). *Successive cyclicity, anti-locality, and adposition stranding*. Ph. D. thesis, University of Connecticut, Storrs, CT.
- Aboh, E. O. and F. Nauze (2008). Tense, mood, and aspect in gungbe (kwa). In W. Abraham and E. Leiss (Eds.), *Modality-Aspect Interfaces: Implications and typological solutions*, Typological Studies in Language 79, pp. 215–239. John Benjamins.
- Abusch, D. (1985). *On verbs and Time*. Ph. D. thesis, University of Massachusetts, Amherst.
- Ackema, P. (1995). *Syntax Below Zero*. Ph. D. thesis, Utrecht University.
- Ackema, P. and A. Neeleman (2003). Context-sensitive spell-out. *Natural Language & Linguistic Theory* 21(4), 681–735.
- Ackerman, F. and G. Stump (2004). Paradigms and periphrastic expression: a study in realization-based lexicalism. In L. Sadler and A. Spencer (Eds.), *Projecting morphology*, pp. 111–158. CSLI Publications.
- Adger, D. (2010). A minimalist theory of feature structure. In A. Kibort and G. Corbett (Eds.), *Features: Perspectives on a key notion in Linguistics*, pp. 185–218. Oxford: Oxford University Press.
- Adger, D. and P. Svenonius (2011). Features in minimalist syntax. In *The Oxford Handbook of Linguistic Minimalism*, pp. 27–51. OUP.
- Aelbrecht, L. (2010). *The syntactic licensing of ellipsis*. John Benjamins.
- Aelbrecht, L. (2016). What ellipsis can do for phases, and what it can't, but not why. *The Linguistic Review* 33(4), 453–482.
- Aelbrecht, L. and W. Harwood (2015). To be or not to be elided: Vp ellipsis revisited. *Lingua* 153, 66–97.
- Agbayani, B., C. Golston, and T. Ishii (2015). Syntactic and prosodic scrambling in Japanese. *Natural Language and Linguistic Theory* 33, 47–77.
- Agbayani, B. and C. Shekar (2008). Restructuring and clausal architecture in Kannada. In S. Karimi, V. Samiian, and W. Wilkins (Eds.), *Clever and Right: Linguistic studies in honor of Joseph Emonds*, pp. 8–24. Amsterdam: John Benjamins.
- Aissen, J. and D. Perlmutter (1976). Clause reduction in Spanish. In H. Thompson, K. Whistler, V. Edge, J. Jaeger, R. Javkin, M. Petruck, C. Smeall, and R. D. V. V. Jr. (Eds.), *Proceedings of BLS 2*, pp. 1–30. Berkeley Linguistic Society.
- Aissen, J. and D. Perlmutter (1983). Clause reduction in Spanish. In D. Perlmutter (Ed.), *Studies in Relational Grammar*, Volume 1, pp. 360–403. Chicago: The University of Chicago Press.
- Akmajian, A., S. M. Steele, and T. Wasow (1979). The category aux in universal grammar. *Linguistic Inquiry* 10(1), 1–64.

- Akmajian, A. and T. Wasow (1975). The constituent structure of vp and aux and the position of the verb be. *Linguistic Analysis* 1, 205–245.
- Alexiadou, A. and E. Anagnostopoulou (1998). Parametrizing agr: word order, v-movement and epp-checking. *Natural Language and Linguistic Theory* 16(3), 491–539.
- Alexiadou, A., E. Anagnostopoulou, and F. Schäfer (2015). *External arguments in transitivity alternations: A layering approach*. Oxford: Oxford University Press.
- Alexiadou, A. and E. Doron (2012). The syntactic construction of two non-active voices: passive and middle. *Journal of Linguistics* 48, 1–34.
- Anand, P. and A. Nevins (2006). The locus of ergative case assignment: Evidence from scope. In A. Johns, D. Massam, and J. Ndayiragije (Eds.), *Ergativity: Emerging Issues*, pp. 3–25. Dordrecht: Springer.
- Anderson, S. R. (1992). *A-morphous morphology*. Cambridge University Press.
- Andersson, L.-G. (1975). *Form and function of subordinate clauses*. University of Gothenburg: Monographs in Linguistics 1, Department of Linguistics.
- Aoyagi, H. (2006). On morphological merger. *Nanzan Linguistics* 3, 1–32.
- Arano, A. (2017a). Multiple scrambling, headless vp-movement, and cyclic linearization. In A. Lamont and K. Tetzloff (Eds.), *Proceedings of NELS 47*, Volume 1, pp. 55–64.
- Arano, A. (2017b). Reconsidering multiple scrambling in Japanese. Ms. UConn.
- Aranovich, R. (2015). Realizational morphology beyond the lexicon: synthetic and periphrastic verbs in Shona. *Language Sciences* 51, 54–66.
- Aronoff, M. and N. Fuhrhop (2002). Restricting suffix combinations in German and English: Closing suffixes and the monosuffix constraint. *Natural Language and Linguistic Theory* 20(3), 451–490.
- Arregi, K. (2000). Tense in Basque. Ms. MIT.
- Arregi, K. and P. Klecha (2015). The morphosemantics of past tense. In *Proceedings of the 45th conference of the North East Linguistic Society*. GLSA, Amherst.
- Arregi, K. and G. Molina-Azaola (2004). Restructuring in Basque and the theory of agreement. In V. Chand, A. Kelleher, A. J. Rodríguez, and B. Schmeiser (Eds.), *The proceedings of WCCFL*, Volume 23, Somerville, pp. 101–114. Cascadia Press.
- Arregi, K. and A. Nevins (2007). Obliteration vs. impoverishment in the Basque g-/z- constraint. In T. Scheffler, J. Tauberer, A. Eilam, and L. Mayol (Eds.), *Proceedings of the 26th Penn Linguistics Colloquium*, Volume 13.1, Philadelphia, pp. 1–14. Penn Linguistics Club.
- Arregi, K. and A. Nevins (2012). *Morphotactics. Basque Auxiliaries and the Structure of Spellout*. Springer.
- Arregi, K. and A. Pietraszko (2019a). Do-support as spellout of split head chains. In M. Baird and J. Pesetsky (Eds.), *Proceedings of NELS 49*, Volume 1, pp. 63–72. GLSA, Amherst.
- Arregi, K. and A. Pietraszko (2019b). The ups and downs of head displacement. *Linguistic Inquiry (to appear)* x, 1–74.
- Arregui, A., M. L. Rivero, and A. Salanova (2014). Cross-linguistic variation in imperfectivity. *Natural Language and Linguistic Theory* 32, 307–362.
- Asher, R. E. and T. C. Kumari (1997). *Malayalam*. Routledge Descriptive Grammars. Routledge.
- Austing, J. and R. Upia (1975). Highlights of ömie morphology. In T. E. Dutton (Ed.), *Studies in languages of Central and South-East Papua*, pp. 513–598. Canberra: Research school of Pacific Studies, Australian National University.
- Aygen, G. (2001). *Finiteness, Clause Structure, and Case*. Ph. D. thesis, Harvard University.
- Bach, E. (1967). Have and be in English syntax. *Language* 43(2), 462–485.

- Baker, M., K. Johnson, and I. Roberts (1989). Passive arguments raised. *Linguistic Inquiry* 20, 219–251.
- Baker, M. C. (1985). The mirror principle and morphosyntactic explanation. *Linguistic Inquiry* 16, 373–415.
- Baker, M. C. (1988). *Incorporation: A theory of grammatical function changing*. Chigago: University of Chigago Press.
- Baker, M. C. (2010). Formal generative typology. In B. Heine and H. Narrog (Eds.), *The Oxford Handbook of Linguistic Analysis*, pp. 285–312. OUP.
- Baker, M. C. and J. McCloskey (2007). On the relationship of typology to theoretical syntax. *Linguistic Typology* 11, 285–296.
- Barret-Keach, C. N. (1986). Word-internal evidence from swahili for aux/infl. *Linguistic Inquiry*, 559–564.
- Baunaz, L. and E. Lander (2018). Nanosyntax: the basics. In L. Baunaz, K. D. Clerq, L. Haegeman, and E. Lander (Eds.), *Exploring Nanosyntax*, pp. 3–56. Oxford: Oxford University Press.
- Beard, R. (1995). *Lexeme-Morpheme Based Morphology: A General Theory of Inflection and Word Formation*. Albany: State University of New York Press.
- Béjar, S. and M. Rezac (2009). Cyclic agree. *Linguistic Inquiry* 40, 35–73.
- Bennis, H. and A. Maclean (2006). Variation in verbal inflection in Dutch dialects. *Morphology* 16, 291–312.
- Bentzen, K., J. Merchant, and P. Svenonius (2013). Deep properties of surface pronouns: Pronominal predicate anaphors in norwegian and german. *Journal of Comparative Germanic Linguistics* 16, 97–125.
- Bhatt, R. (2007). Ergativity in indo-aryan languages. Handout from talk presented at *MIT Ergativity Seminar*.
- Bhatt, R. and D. Embick (2003). Causative derivations in hindi. Ms. University of Texas and University of Pennsylvania.
- Biberauer, T. and I. Roberts (2010). Subjects, tense and verb-movement. In T. Biberauer, A. Holmberg, I. Roberts, and M. Sheehan (Eds.), *Parametric Variation: Null Subjects in Minimalist Theory*. Cambridge University Press.
- Biberauer, T. and I. Roberts (2016). Parameter typology from a diachronic perspective; the case of conditional inversion. In E. Bidese, F. Cognola, and M. C. Moroni (Eds.), *Theoretical approaches to linguistic variation*, pp. 259–292. John Benjamins.
- Bjorkman, B. (2011). *BE-ing Default: the Morphosyntax of Auxiliaries*. Ph. D. thesis, MIT.
- Bjorkman, B. (2014). Verbal inflection and overflow auxiliaries. Ms. Queens University.
- Bjorkman, B. (2017). How to do things with verbs. In C. Halpert, H. Kotek, and C. van Urk (Eds.), *A Pesky set: Papers for David Pesetsky*, Number 80 in MIT Working Papers in Linguistics. MITWPL.
- Bjorkman, B. and H. Zeijlstra (2019). Checking up on (phi-) agree. *Linguistic Inquiry* 50, 572–596.
- Bloomfield, L. (1933). *Language*. Chigago and London: University of Chigago Press.
- Bobaljik, J. D. (1994). What does adjacency do? In H. Harley and C. Phillips (Eds.), *The morphology-syntax connection*, Volume 22, pp. 1–32. Cambridge, MA: MIT Working Papers in Linguistics.
- Bobaljik, J. D. (1995). *Morphosyntax: The syntax of verbal inflection*. Ph. D. thesis, MIT.
- Bobaljik, J. D. (2012). *Universals in Comparative Morphology: Suppletion, superlatives, and the structure of words*. MIT Press.

- Bobaljik, J. D. and H. Harley (2017). Suppletion is local: Evidence from hiaki. In H. Newell, M. Noonan, G. Piggot, and L. Travis (Eds.), *The structure of words at the interfaces*. Oxford University Press.
- Bobaljik, J. D. and H. Thráinsson (1998). Two heads aren't always better than one. *Syntax* 1(1), 37–71.
- Bobaljik, J. D. and S. Wurmbrand (2001). Notes on agreement in itelmen. *Linguistic discovery* 1(1).
- Bobaljik, J. D. and S. Wurmbrand (2005). The domain of agreement. *Natural Language and Linguistic Theory* 23(4), 809–865.
- Bobaljik, J. D. and S. Wurmbrand (2007). Complex predicates, aspect, and anti-reconstruction. *Journal of East Asian Linguistics* 16, 27–42.
- Bogomolets, K. (2020). *Lexical accent in languages with complex morphology*. Ph. D. thesis, University of Connecticut.
- Bogomolets, K., P. Fenger, and A. Stegovec (2017). Unifying v-c movement in algonquian and germanic: A view from the outliers. In A. Arani and M. Šereikaitė (Eds.), *University of Pennsylvania Working Papers in Linguistics*, Volume 24:1 article 6, pp. 1–10.
- Bogomolets, K., P. Fenger, and A. Stegovec (2019). Movement in disguise. morphology as a diagnostic for verb movement in algonquian. Ms. University of Connecticut.
- Booij, G. (1985). Coordination reduction in complex words: a case for prosodic phonology. In H. van der Hulst and N. Smith (Eds.), *Non-linear Phonology*, pp. 143–160. Foris.
- Booij, G. and J. Rubach (1984). Morphological and prosodic domains in lexical phonology. *Phonology Yearbook* 1, 1–27.
- Borer, H. (1994). The projections of arguments. In E. Benedicto and J. Runner (Eds.), *Functional projections*, pp. 19–47. Amherst, MA: GLSA.
- Bošković, Željko. (1997). *The syntax of nonfinite complementation. An Economy approach*. Linguistic Inquiry Monographs 32. Cambridge, MA: MIT Press.
- Bošković, Željko. (2014). Now i'm a phase, now i'm not a phase. *LI* 45(1), 27–89.
- Bošković, Željko. (2018). On affixal articles: An argument from bantu for bulgarian, romanian, and icelandic. In S. L. Franks, V. Chidambaram, B. D. Joseph, and I. Krapova (Eds.), *Katerino Mome: Studies in Bulgarian Morphosyntax in honor of Catherine Rudin*, pp. 37–52. Bloomington, IN: Slavica Publishers.
- Bowers, J. (1993). The syntax of predication. *Linguistic Inquiry* 24, 591–656.
- Brittain, J. (1999). *The distribution of the conjunct verb form in Western Naskapi and related morpho-syntactic issues*. Ph. D. thesis, Memorial U. of Newfoundland.
- Brittain, J. (2001). *The Morphosyntax of the Algonquian Conjunct Verb*. New York: Garland.
- Bruening, B. (2013). By-phrases in passives and nominals. *Syntax* 16, 1–41.
- Bulatova, N. and L. Grenoble (1999). *Evenki*. Number 141 in Languages of the World. Lincom Europa.
- Butler, J. (2004). *Phase structure, phrase structure, and quantification*. Ph. D. thesis, University of York.
- Bybee, J., R. Perkins, and W. Pagliuca (1994). *The evolution of grammar: Tense, Aspect, and Modality in the languages of the world*. Chicago and London: The university of Chicago Press.
- Bybee, J. L. (1985). *Morphology. A study of the relation between meaning and form*. Amsterdam: Benjamins.
- Bybee, J. L. and O. Dahl (1989). The creation of tense and aspect systems in the languages of the world. *Studies in Language* 13(1), 51–103.

- Calabrese, A. (2011). Investigations on markedness, syncretism and zero exponence in morphology. *Morphology* 21, 283–325.
- Calabrese, A. (2019). Morphophonological investigations: A theory of pf. Ms. University of Connecticut.
- Calabrese, A. and D. Pescarini (2014). Clitic metathesis in the friulian dialect of forni di sotto. *Probus* 26, 275–308.
- Camaj, M. (1984). *Albanian Grammar*. Wiesbaden: Otto Harrassowitz.
- Carstens, V. (2010). Head-movement in the bantu dps. Paper presented at the North East Linguistic Society 41.
- Carstens, V. (2017). Noun-to-determiner movement. In M. Everaert and H. van Riemsdijk (Eds.), *The wiley Blackwell Companion to Syntax*, pp. 2578–2783. John Wiley & Sons, Inc.
- Carstens, V. and K. Kinyalolo (1989). On ip structure: Tense, aspect, and agreement. Ms. Cornell University.
- Chomsky, N. (1957). *Syntactic Structures*. Mouton de Gruyter.
- Chomsky, N. (1973). Conditions on transformations. In S. Anderson and P. Kiparsky (Eds.), *A festschrift for Morris Halle*. Holt, Rinehart and Winston.
- Chomsky, N. (1986). *Barriers*. Number 13 in Linguistic Inquiry Monographs. MIT Press.
- Chomsky, N. (1991). Some notes on economy of derivation and representation. In R. Freidin (Ed.), *Principles and parameters in comparative grammar*, pp. 417–454. Cambridge, MA: MIT Press.
- Chomsky, N. (1993). A minimalist program for linguistic theory. In K. Hale and S. J. Keyser (Eds.), *The view from building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, pp. 1–52. MIT Press.
- Chomsky, N. (1995). *The Minimalist Program*. MIT Press.
- Chomsky, N. (2000). Minimalist inquiries: The framework. In D. M. Roger Martin and J. Uriagereka (Eds.), *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, pp. 89–156. Cambridge, MA: MIT Press.
- Chomsky, N. (2001). Derivation by phase. In M. Kenstowicz (Ed.), *Ken Hale: A life in language*, pp. 1–52. Cambridge, MA: MIT Press.
- Chomsky, N. (2008). On phases. In R. Freidin, D. Michaels, C. P. Otero, and M. L. Zubizarreta (Eds.), *Foundational issues in linguistic theory: Essays in honor of Jean-Roger Vergnaud*, pp. 133–166. Cambridge, MA: MIT Press.
- Chumakina, M. (2013). Periphrasis in archi. In M. Chumakina and G. G. Corbett (Eds.), *Periphrasis: The role of syntax and morphology in paradigms*, Volume 180 of *Proceedings of the British Academy*, pp. 27–52. Oxford University Press.
- Chung, S. (2004). Restructuring and verb-initial order in chamorro. *Syntax* 7, 199–233.
- Cinque, G. (1998). ‘restructuring’ and the order of aspectual and root modal heads. *University of Venice, Working Papers in Linguistics* 8, 113–140.
- Cinque, G. (1999). *Adverbs and Functional Heads: A Cross-Linguistic Perspective*. Oxford studies in Comparative Syntax.
- Cinque, G. (2001). A note on mood, modality, tense and aspect affixes in turkish. In E. E. Taylan (Ed.), *The verb in Turkish*, pp. 47–60. Amsterdam/Philadelphia: John benjamins Publishing Company.
- Cinque, G. (2004). ‘restructuring’ and functional structure. In A. Belletti (Ed.), *Structures and beyond: the cartography of syntactic structures*, Volume 3, pp. 132–191. Oxford: Oxford University Press.

- Cinque, G. (2005). Deriving greenberg's universal 20 and its exceptions. *Linguistic Inquiry* 36(3), 315–332.
- Cinque, G. (2007). A note on linguistic theory and typology. *Linguistic Typology* 11, 93–106.
- Cinque, G. (2017). On the status of functional categories (heads and phrases). In *Language and Linguistics*, Volume 18:4, pp. 521–576. John Benjamins Publishing Company.
- Clements, G. N. and E. Sezer (1982). Vowel and consonant disharmony in turkish. In H. van der Hulst and N. Smith (Eds.), *The structure of phonological representations, part 2*, pp. 213–255. Dordrecht: Foris.
- Collins, C. (2005). A smuggling approach to the passive in english. *Syntax* 8, 81–120.
- Compton, R. and C. Pittman (2010). Word-formation by phase in inuit. *Lingua* 120, 2167–2192.
- Comrie, B. (1976). *Aspect*. Cambridge textbooks in Linguistics. Cambridge University Press.
- Comrie, B. (1985). *Tense*. Cambridge: Cambridge University Press.
- Coon, J. (2010). Rethinking split ergativity in chol. *International Journal of American Linguistics* 76(2), 207–253.
- Copley, B. (2002). *The Semantics of the future*. Ph. D. thesis, MIT.
- Copley, B. (2009). *The semantics of the future*. Outstanding Dissertations in Linguistics. New York: Routledge.
- Corver, N. and H. van Riemsdijk (Eds.) (2001). *Semi-lexical Categories*. Studies in Generative Grammar 59. Berlin, New York: Mouton de Gruyter.
- Cowper, E. (2010). Where auxiliary verbs come from. In M. Heijl (Ed.), *Proceedings 2010 conference of the Canadian Linguistic Association*. CLA.
- Creemers, A., J. Don, and P. Fenger (2018). Some affixes are roots and some are heads. *Natural Language and Linguistic Theory* 36(1), 45–84.
- Crook, H. (1999). *The phonology and morphology of Nez Perce stress*. Ph. D. thesis, University of California at Los Angeles.
- Şener, S. (2010). *(Non-)peripheral matters in Turkish Syntax*. Ph. D. thesis, University of Connecticut, Storrs.
- Şener, S. and D. Takahashi (2010). Ellipsis of arguments in japanese and turkish. *Nanzan Linguistics* 6, 79–99.
- Cyrino, S. and G. Matos (2002). Vp ellipsis in european and brazilian portugese - a comparative analysis. *Journal of Portuguese Linguistics* 1(2), 177–195.
- Cyrino, S. and G. Matos (2005). Local licensers and recovering in vp ellipsis. *Journal of Portuguese Linguistics* 4, 79–112.
- Dahl, O. (1985). *Tense and Aspect Systems*. Basil Blackwell Inc.
- D'Alessandro, R., I. Franco, and A. J. Gallego (2017). *The Verbal Domain*. Oxford studies in Theoretical Linguistics. Oxford University Press.
- D'Alessandro, R. and T. Scheer (2015). Modular pic. *Linguistic Inquiry* 46(4), 593–624.
- Danckaert, L. (2017). *The development of latin clause structure. A study of the Extended Verb Phrase*. Oxford studies in diachronic and historical linguistics. Oxford University Press.
- Davis, C. (2014). Unifying nominalized clauses, auxiliaries, and copular allomorphy in north azeri. BA thesis, University of Minnesota Twin Cities.
- Davis, C. (2018). Auxiliaries in north azeri and some related issues. In *Proceedings of Tu+1*.
- Deal, A. (2009). The origin and content of expletives: evidence from 'selection'. *Syntax* 12, 285–323.
- Déchaine, R.-M. (1993). *Predicates across categories: Towards a category-neutral syntax*. Ph. D.

- thesis, University of Massachusetts, Amherst.
- Déchaine, R.-M. (1995). *One be*. *Linguistics in the Netherlands* 12, 73–88.
- den Besten, H. (1983). On the interaction of root transformations and lexical deletive rules. In W. Abrahams (Ed.), *On the formal syntax of the Westgermania*, pp. 47–131. Amsterdam: John Benjamins. Reprinted in den Besten 1989 *Studies in Westgermanic syntax* PhD dissertation, Katholieke Universiteit Brabant.
- den Dikken, M. (2007). Phase extension: Contours of a theory of the role of head movement in phrasal extraction. *Theoretical Morphology* 33(1), 1–41.
- Deo, A. (2020). Imperfectivity. In L. Matthewson, C. Meier, H. Rullman, and T. E. Zimmermann (Eds.), *Companion to Semantics*. New York: Wiley-Blackwell.
- Di Sciullo, A.-M. and E. Williams (1987). *On the definition of Word*. Cambridge, MA: MIT Press.
- Dik, S. (1983). Auxiliary and copula *be* in a functional grammar of english. In F. Heny and B. Richards (Eds.), *Linguistic Categories: auxiliaries and related puzzles*, pp. 121–143. Dordrecht: Reidel.
- Dik, S. (1987). Copula auxiliarization: how and why? In M. Harris and P. Ramat (Eds.), *Historical development of auxiliaries*, Number 35 in Trends in Linguistics, pp. 53–84. Mouton de Gruyter.
- Dixon, R. M. W. (1994). *Ergativity*. Cambridge, UK: Cambridge University Press.
- Dixon, R. M. W. and A. Y. Aikhenvald (Eds.) (2002). *Word. A Cross-Linguistic Typology*. Cambridge University Press.
- Don, J., P. Fenger, and O. Koenenman (2013). *Micro-variation as a tool for Linguistic Analysis*. Talk presented at GLOW 36.
- Dugast, I. (1971). *Grammaire du tunen*. Langues et Littératures de l’Afrique Noire 8. Paris: Klincksick.
- Dum-Tragut, J. (2009). *Armenian: Modern Eastern Armenian*, Volume 14 of *London Oriental and African Language Library*. Amsterdam/Philadelphia: John Benjamins.
- Embick, D. (2000). Features, syntax, and categories in the latin perfect. *Linguistic Inquiry* 31(2), 185–230.
- Embick, D. (2004). On the structure of resultative participles in english. *Linguistic Inquiry* 31, 185–392.
- Embick, D. (2007). Linearization and local dislocation: Derivational mechanics and interactions. *Linguistic Analysis* 33(3-4), 303–336.
- Embick, D. (2010). *Localism versus Globalism in Morphology and Phonology*. Cambridge, MA: MIT Press.
- Embick, D. and M. Halle (2004). The latin conjugation. Ms. UPenn and MIT.
- Embick, D. and A. Marantz (2008). Architecture and blocking. *Linguistic Inquiry* 39, 1–53.
- Embick, D. and R. Noyer (2001). Movement operations after syntax. *Linguistic Inquiry* 32, 555–595.
- Emonds, J. E. (1978). The verbal complex *v’-v* in french. *Linguistic Inquiry* 9, 151–175.
- Endo, Y. (2007). *Locality and information structure*. John Benjamins Publishing Company.
- Engdahl, E. (1999). The choice between *bli*-passive and *s*-passive in Danish, Norwegian and Swedish. Ms. Göteborg University.
- Erguvanlı-Taylan, E. (1984). *The function of word order in Turkish Grammar*. University of California Press.
- Fenger, P. (2012). Verklaringen voor veranderingen van werkwoordsvormen in inversie. BA thesis, University of Amsterdam.

- Fenger, P. (2017). Headmovement: the view from failure. Ms. UConn.
- Fenger, P. (2018). Multiple agreeing persons is not that special: restrictions on person portmanteaux. In A. Arani and M. Šereikaitė (Eds.), *University of Pennsylvania Working Papers in Linguistics*, Volume 24:1 article 9, pp. 1–10.
- Fenger, P. (2019). Size matters: auxiliary formation in the morpho-syntax and morpho-phonology. In M. Baird and J. Pesetsky (Eds.), *Proceedings of the North Eastern Linguistic Society 49*. Amherst, MA: GLSA.
- Fortescue, M. (1984). *West Greenlandic*. London: Croom Helm.
- Fowlie, M. (2013). Multiple multiple spellout. In T. Biberauer and I. Roberts (Eds.), *Challenges to Linearization*, Number 114 in *Studies in Generative Grammar*, pp. 129–170. Mouton de Gruyter.
- Fox, D. and D. Pesetsky (2003). Cyclic linearisation and the typology of movement. Ms. MIT.
- Fujimaki, K. (2009). On the relative structural position of high adverbs and the interpretation of *ga*-marked subject. Paper presented at the 139th meeting of the linguistic society of Japan.
- Fukuda, S. (2012). Aspectual verbs as functional heads: evidence from japanese aspectual verbs. *Natural Language and Linguistic Theory* 30(4), 965–1026.
- Fukui, N. and H. Sakai (2003). The visibility guideline for functional categories: Verb raising in japanese and related issues. *Lingua* 113, 321–375.
- Fukui, N. and H. Sakai (2006). The visibility guideline for functional categories: Verb raising in japanese and related issues. In N. Fukui (Ed.), *Theoretical comparative syntax*, pp. 289–336. Routledge.
- Fukui, N. and Y. Takano (1998). Symmetry in syntax: Merge and demerge. *Journal of East Asian Linguistics* 7, 27–86.
- Fukushima, K. (1999). Bound morphemes, coordination and bracketing paradox. *Journal of Linguistics* 35(2), 297–320.
- Funakoshi, K. (2014). *Syntactic head movement and its consequences*. Ph. D. thesis, University of Maryland.
- Funakoshi, K. (2016). Verb-stranding verb phrase ellipsis in japanese. *Journal of East Asian Linguistics* 25, 113–142.
- Funakoshi, K. (2020). Verb-raising and vp-fronting in japanese. *The Linguistic Review* 37(1), 117–146.
- Gallego, A. J. (2010). *Phase Theory*, Volume 152 of *Linguistic Today*. Amsterdam/Philadelphia: John Benjamins Publishing Company.
- Gallego, A. J. and J. Uriagereka (2007a). Conditions on sub-extraction. In L. Eguren and O. Fernández-Soriano (Eds.), *Coreference, Modality, and Focus*, pp. 45–70. Amsterdam: John Benjamins.
- Gallego, A. J. and J. Uriagereka (2007b). A critique of phase extension, with a comparison to phase sliding. *Theoretical Linguistics* 33(1), 1–41.
- Gallego, A. J. and J. Uriagereka (2007c). Subextraction from subjects: A phase theory account. In J. Camacho, N. Flores-Ferrán, L. Sánchez, V. Deprez, and M. J. Cabrera (Eds.), *Romance Linguistics 2006: Selected papers from the 26th Linguistic Symposium on Romance Languages (LSRL)*, pp. 155–168. Amsterdam: John Benjamins.
- Genetti, C. (2007). *A Grammar of Dolakha Newar*. Mouton de Gruyter.
- Gengel, K. (2007). Phases and ellipsis. In E. Elfner and M. Walkow (Eds.), *Proceedings of the 37th meeting of the North East Linguistic Society*, University of Massachusetts, Amherst, pp. 233–246. GLSA.

- Gengel, K. (2008). Phases and ellipsis. *Linguistic Analysis* 35, 21–42.
- Giorgi, A. and F. Pianesi (1997). *Tense and Aspect. From Semantics to Morphosyntax*. New York / Oxford: Oxford University Press.
- Givón, T. (1980). The binding hierarchy and the typology of complements. *Studies in Language* 4(3), 333–377.
- Göksel, A. and C. Kerslake (2005). *Turkish: A comprehensive Grammar*. London: Routledge.
- Goldberg, L. (2005). *Verb-Stranding VP ellipsis*. Ph. D. thesis, McGill.
- Gouskova, M. and J. D. Bobaljik (2020). Allomorphy and vocabulary insertion. Submitted to *Handbook of Distributed Morphology*, CUP.
- Grano, T. (2012). *Control and restructuring at the syntax-semantics interface*. Ph. D. thesis, University of Chicago.
- Gribanova, V. (2013). Verb-stranding verb phrase ellipsis and the structure of the russian verbal complex. *Natural Language and Linguistic Theory* 31(1), 91–136.
- Gribanova, V. (2017). Head movement and ellipsis in the expression of russian polarity focus. *Natural Language and Linguistic Theory* 35(4), 1079–1121.
- Gribanova, V. (2018). Head movement, ellipsis, and identity. Ms. Stanford University.
- Gribanova, V. (2020). Head movement, ellipsis, and identity: the view from uzbek. *handout presented at Harvard Linguistic Circle 2/21*.
- Gribanova, V. and L. Mikkelsen (2018). On the interaction of head movement and ellipsis in danish. In D. Rudin, K. Sasaki, L. Mikkelsen, and J. Merchant (Eds.), *A reasonable way to proceed: Essays in honor of Jim McCloskey*, pp. 105–125. University of California, Santa Cruz.
- Grimshaw, J. (1990). Extended projection. Ms, Brandeis University, Waltham, MA.
- Grimshaw, J. and R.-A. Mester (1985). Complex verb formation in eskimo. *Natural Language and Linguistic Theory* 3, 1–19.
- Gruzdeva, E. (1998). *Nivkh*. Languages of the World. Lincom Europa.
- Güneş, G. (2009). On the formation of [v+v] compounds in turkish. In *2nd mediterranean Graduate Students Meeting in Linguistics*. Mersin, Turkiye.
- Hacquard, V. (2010). On the event relativity of modal auxiliaries. *Natural Language Semantics* 18(1), 79–114.
- Haider, H. and M. Prinzhorn (Eds.) (1986). *Verb second phenomena in Germanic languages*. Dordrecht: Foris.
- Hale, K. and S. J. Keyser (1993). On argument structure and the lexical expression of syntactic relations. In K. Hale and S. J. Keyser (Eds.), *The view from building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, pp. 53–109. Cambridge, MA: MIT Press.
- Hall, B. L., R. Hall, M. D. Pam, A. Myers, S. A. Antell, and G. K. Cheronon (1974). Lenition degrades information: Consonant allomorphy in ibibio. *Afrika und Übersee* 57, 241–267.
- Hall, B. L. and R. M. R. Hall (1980). Nez perce vowel harmony: an africanist explanation and some theoretical questions. In R. M. Vago (Ed.), *Issues in Vowel Harmony: Proceedings of the CUNY Linguistics Conference on Vowel Harmony*, Amsterdam, pp. 201–236. John Benjamins.
- Halle, M. and A. Marantz (1993). Distributed morphology and the pieces of inflection. In K. Hale and S. J. Keyser (Eds.), *The view from building 20*, pp. 111–176. Cambridge: MIT Press.
- Halle, M. and A. Marantz (1994). Some key features of distributed morphology. In A. Carnie, H. Harley, and T. Bures (Eds.), *Papers on Phonology and Morphology*, pp. 275–288. Cambridge, MA: MITWPL.
- Hanink, E. A. (2018). Super light-headed relatives, missing prepositions, and span-conditioned

- allomorphy in german. *Journal of Comparative Germanic Linguistics* 21, 247–290.
- Harbour, D. (2016). Parameters of poor pronoun systems. *Linguistic Inquiry* 47(4), 706–722.
- Harizanov, B. (2014). Clitic doubling at the syntax-morphophonology interface: A-movement and morphological merger in bulgarian. *Natural Language and Linguistic Theory* 32(4), 1033–1088.
- Harizanov, B. and V. Gribanova (2019). Whither head movement? *Natural Language and Linguistic Theory* 37(2), 461–522.
- Harley, H. (2004). Merge, conflation and head movement: The first sister principle revisited. In K. Moulton and M. Wolf (Eds.), *Proceedings of NELS 34*, Volume 1, pp. 239–254. GLSA, Amherst.
- Harley, H. (2008). On the causative construction. In S. Miyagawa and M. Saito (Eds.), *Handbook of Japanese Linguistics*, pp. 20–53. Oxford: Oxford University Press.
- Harley, H. (2017). The ‘bundling’ hypothesis and the disparate functions of little v. In R. D’Alessandro, I. Franco, and A. J. Gallego (Eds.), *The Verbal Domain*, pp. 3–28. Oxford: Oxford University Press.
- Harwood, W. (2013). *Being Progressive is Just a Phase: Dividing the Functional Hierarchy*. Ph. D. thesis, Ghent University.
- Harwood, W. (2014). Rise of the auxiliaries: a case for auxiliary raising vs. affix lowering. *The Linguistic Review* 31(2), 295–362.
- Harwood, W. (2015). Being progressive is just a phase: celebrating the uniqueness of progressive aspect under a phase-based analysis. *Natural Language and Linguistic Theory* 33, 523–573.
- Haspelmath, M. (1994). Passive participles across languages. In P. J. Hopper (Ed.), *Typological Studies in Language: Voice: Form and Function*, Volume 150–176. John Benjamins.
- Hayashi, S. (2015). *head movement in an agglutinative SOV language*. Ph. D. thesis, Yokohama National University.
- Hayashi, S. and T. Fujii (2015). String vacuous head movement: The case of v-*te* in japanese. *Gengo kenkyu* 147, 31–55.
- Hein, J. (2017). Doubling and *do*-support in verbal fronting: Towards a typology of repair operations. *Glossa* 2(1), 1–36.
- Hein, J. (2018). *Verbal Fronting: Typology and theory*. Ph. D. thesis, Universität Leipzig.
- Heltoft, L. and L. Falster Jakobsen (1996). Danish passives and subject positions as a mood system. In E. Engberg-Pedersen, M. Fortescue, P. Harder, L. Heltoft, and L. Falster Jakobsen (Eds.), *Content, Expression and Structure: Studies in Danish Functional Grammar*, pp. 199–234. Amsterdam: John Benjamins.
- Henderson, R. (2017). Pluractionality in mayan. In J. Aissen, N. C. England, and R. Z. Maldonado (Eds.), *The Mayan Languages*, Language Family Series. Routledge.
- Henry, A. and S. Cottell (2007). A new approach to transitive expletives: evidence from belfast english. *English Language and Linguistics* 11, 279–299.
- Heycock, C. (2005). Embedded root phenomena. In M. Everaert and H. van Riemsdijk (Eds.), *The blackwell Companion to syntax* 5. Oxford: Blackwell.
- Heycock, C. and J. Wallenberg (2013). How variational acquisition drives syntactic change: the loss of verb movement in scandinavian. *Journal of Comparative Germanic Linguistics*, 127–157.
- Hinds, J. (1973). Some remarks on soo-su. *Papers in Japanese Linguistics* 2, 18–30.
- Hiraiwa, K. (2010). Scrambling to the edge. *Syntax* 13(2), 133–164.
- Hoffman, R. (1966). Past tense replacement and the modal system. In A. Oettinger (Ed.), *Mathematical linguistics and automatic translation*. Cambridge, MA: Harvard University, Harvard

- Computation Laboratory.
- Hoji, H. (1985). *Logical form constraints and configurational structures in Japanese*. Ph. D. thesis, University of Washington.
- Hoji, H. (1998). Null objects and sloppy identity in Japanese. *Linguistic Inquiry* 29, 127–152.
- Holmberg, A. (1986). *Word order and syntactic features in the Scandinavian languages and English*. Ph. D. thesis, Stockholm University.
- Holmberg, A. (1999). Yes and no in Finnish: ellipsis and cyclic spell-out. *MIT Working Papers in Linguistics* 33.
- Holmberg, A. (2000). Expletives and agreement in Scandinavian passives. *Working papers in Scandinavian Syntax* 65, 35–64.
- Holmberg, A. (2001). The syntax of yes and no in Finnish. *Studia Linguistica* 55, 140–174.
- Holmberg, A. and C. Platzack (1995). *The Role of Inflection in the Syntax of the Scandinavian Languages*. OUP.
- Hooper, J. and S. Thompson (1973). On the applicability of root transformations. *Linguistic Inquiry* 4, 465–497.
- Houser, M., L. Mikkelsen, and M. Toosarvandani (2011). A defective auxiliary in Danish. *Journal of Germanic Linguistics* 23, 245–298.
- Hualde, J. I. and J. O. de Urbina (2003). *A grammar of Basque*. Berlin, New York: Mouton de Gruyter.
- Huang, C.-T. J. (1982). *Logical relations in Chinese and the theory of grammar*. Ph. D. thesis, MIT.
- Huddleston, R. (1974). Further remarks on the analysis of auxiliaries as main verbs. *Foundations of language* 11, 215–229.
- Hyman, L. M. (2008). Directional asymmetries in the morphology and phonology of words, with special reference to Bantu. *Linguistics* 46(2), 309–350.
- Iatridou, S. (1990). About agr(p). *Linguistic Inquiry* 21(4), 551–577.
- Iatridou, S., E. Anagnostopoulou, and R. Izvorski (2003). Observations about the form and meaning of the perfect. In A. Alexiadou, M. Rathert, and A. von Stechow (Eds.), *Perfect explorations*, Volume 2 of *Interface Explorations*, pp. 153–204. Berlin: Mouton de Gruyter.
- Iatridou, S. and A. S. Kroch (1992). The licensing of cp-recursion and its relevance to the Germanic verb-second phenomenon. *Working Papers in Scandinavian Syntax* 50, 1–25.
- ichi Harada, S. (1977). Nihongo-ni henkei-wa hituyoo-da [there are transformations in Japanese]. *Gengo* 6(10-11), 88–95, 96–103.
- Inkelas, S. (1999). Exceptional stress-attracting suffixes in Turkish: Representations vs. the grammar. In H. van der Hulst, R. Kager, and W. Zonneveld (Eds.), *The Prosody-Morphology Interface*, pp. 134–187. Cambridge University Press.
- Inkelas, S. and C. O. Orgun (1998). Level (non)ordering in recursive morphology: evidence from Turkish. In P. Farrell (Ed.), *Morphology and its relation to phonology and syntax*, pp. 763–793. Stanford, CA: CSLI.
- Inkelas, S. and C. O. Orgun (2003). Turkish stress: a review. *Phonology* 20, 139–161.
- Inoue, K. (1969). *A study of Japanese Syntax*. Mouton de Gruyter.
- Inoue, K. (1978). *nihongo no bunpoo kisoku [Grammatical rules in Japanese]*. Taishukan.
- Ito, J. and A. Mester (2009). The onset of the prosodic word. In S. Parker (Ed.), *Phonological argumentation: Essays on evidence and motivation*, pp. 227–260. Equinox.
- Ito, J. and A. Mester (2013). Prosodic subcategories in Japanese. *Lingua* 124, 20–40.
- Ito, J. and A. Mester (2015). Word formation and phonological processes. In H. Kubozono (Ed.),

- Handbook of Japanese Phonetics and Phonology*, pp. 363–395. Mouton de Gruyter.
- Jansen, J. W. (2010). *A grammar of Yakima Ichishkiin / Sahaptin*. Ph. D. thesis, University of Oregon.
- Johnson, K. (1991). Object positions. *Natural Language & Linguistic Theory* 9, 577–636.
- Jonas, D. (1996). *Clause structure and verb syntax in scandinavian and english*. Ph. D. thesis, Harvard University, Cambridge, MA.
- Joseph, B. D. (2002). Defining "words" in modern greek: a response to philippaki-warbuton & spyropoulos 1999. In G. Booij and J. van Marle (Eds.), *Yearbook of Morphology 2001*, pp. 87–114. Kluwer.
- Julien, M. (2002). *Syntactic heads and word formation: a study of verbal inflection*. OUP.
- Kabak, B. and I. Vogel (2001). The phonological word and stress assignment in turkish. *Phonology* 18, 315–360.
- Kageyama, T. (1982). Word formation in japanese. *Lingua* 57, 215–258.
- Kageyama, T. (1993). *Bunpoto gokeisei [grammar and word formations]*. Tokyo: Hitsuji Shobo.
- Kageyama, T. (1999). Word formation. In N. Tsujimura (Ed.), *The handbook of Japanese linguistics*, pp. 297–325. Oxford: Blackwell.
- Kageyama, T. (2016). Verb-compounding and verb-incorporation. In M. Shibatani and T. Kageyama (Eds.), *Handbook of Japanese lexicon and word formation*, pp. 273–310. Boston/Berlin: Walter de Gruyter.
- Kahnemuyipour, A. (2006). Declassifying turkish ‘pre-stressing’ suffixes. In *Proceedings of the 2006 Canadian Linguistic Association*.
- Kamali, B. (2011a). The question particle in turkish: Consequences for the interfaces. In *Online complement to Proceedings of WCCFL*, Volume 28.
- Kamali, B. (2011b). *Topics at the PF interface of Turkish*. Ph. D. thesis, Harvard University.
- Kamp, H. and U. Reyle (1993). *From discourse to logic: an introduction to modeltheoretic semantics of natural language, formal logic and DRT*. Dordrecht: Kluwer.
- Kang, J. (2014). *On the absence of TP and its consequences: evidence from Korean*. Ph. D. thesis, University of Connecticut.
- Karlsson, F. (1999). *Finnish: an essential grammar*. Routledge.
- Kastner, I. and V. Zu (2017). Blocking and paradigm gaps. *Morphology* 27(4), 643–684.
- Kawahara, S. (2015). The phonology of japanese accent. In H. Kubozono (Ed.), *The handbook of Japanese phonetics and phonology*, pp. 445–492. Berlin, Boston: De Gruyter, Mouton.
- Kayne, R. (1993). Toward a modular theory of auxiliary selection. *Studia Linguistica* 47, 3–31.
- Kehler, A. (2002). *Coherence, reference, and the theory of grammar*. Stanford, CA: CSLI.
- Keine, S. (2017). Agreement and vp phases. In N. LaCara, K. Moulton, and A.-M. Tessier (Eds.), *A Schrif to Fest Kyle Johnson*, Volume 1, pp. 177–185. University of Massachusetts, Amherst: Linguistic Open Access Publications.
- Kelepir, M. (2001). *Topics in Turkish syntax: Clause Structure and Scope*. Ph. D. thesis, MIT.
- Khumalo, L. (2007). *An analysis of the Ndebele Passive Construction*. Ph. D. thesis, University of Oslo.
- Kibrik, A. E. (1977). *Opyt strukturnogo opisanija arčinskogo jazyka T.3. Dinamičeskaja grammatika*. Moskva: Izdatel'stvo Moskovsogo Universiteta.
- Kiparsky, P. (1998). Partitive case and aspect. In M. Butt and W. Geuder (Eds.), *The projection of arguments*, pp. 265–307. Stanford, CA: CSLI.
- Kiparsky, P. (2005). Blocking and periphrasis in inflectional paradigms. *Yearbook of Morphol-*

- ogy 204, 113–135.
- Kiparsky, P. (2010). Dvandvas, blocking and the associative: the bumpy ride from phrase to word. *Language* 86(2), 302–331.
- Kishimoto, H. (2006). Japanese syntactic nominalization and vp-internal syntax. *Lingua* 116, 771–810.
- Kishimoto, H. (2013). Verbal complex formation and negation in Japanese. *Lingua* 135, 132–154.
- Kitagawa, C. (1982). Topic constructions in Japanese. *Lingua* 57, 175–214.
- Klein, W. (1994). *Time in Language*. Psychology Press.
- Koenenman, O. (2000). *The flexible nature of verb movement*. Ph. D. thesis, Utrecht University.
- Koenenman, O. and H. Zeijlstra (2014). The rich agreement hypothesis rehabilitated. *Linguistic Inquiry* 45(4), 571–615.
- Koizumi, M. (1995). *Phrase structure in minimalist syntax*. Ph. D. thesis, MIT.
- Koizumi, M. (2000). String vacuous overt verb raising. *Journal of East Asian Linguistics* 9, 227–285.
- Kolia, J. A. (1975). A balawaia grammar sketch and vocabulary. In T. E. Dutton (Ed.), *Studies in languages of Central and South-East Papua*, Number 29 in C, pp. 107–226. Research school of Pacific Studies, Australian National University.
- Koopman, H. (1984). *The Syntax of Verbs: From Verb Movement in the Kru Languages to Universal Grammar*. Dordrecht: Foris.
- Koopman, H. (2005). Korean (and Japanese) morphology from a syntactic perspective. *Linguistic Inquiry* 36, 601–633.
- Koopman, H. and A. Szabolcsi (2000). *Verbal Complexes*, Volume 34 of *Current Studies in Linguistics*. MIT Press.
- Kornfilt, J. (1987). Turkish and the Turkic languages. In B. Comrie (Ed.), *The world's major languages*, pp. 619–644. Oxford University Press.
- Kornfilt, J. (1996). On copular clitic forms in Turkish. In A. Alexiadou, N. Fuhrkop, P. Law, and S. Löhken (Eds.), *ZAS Papers in Linguistics*, Berlin, pp. 96–114. ZAS.
- Kornfilt, J. (1997). *Turkish*. Descriptive Grammars. Routledge.
- Kosmeijer, W. (1986). The status of the finite inflection in Icelandic and Swedish. *Working Papers in Scandinavian Syntax* 26, 1–41.
- Kratzer, A. (1994). The event argument and the semantics of voice. MS. University of Massachusetts.
- Kratzer, A. (1996). Severing the external argument from its verb. In J. Rooryck and L. Zaring (Eds.), *Phrase Structure and the Lexicon*, pp. 109–137. Dordrecht: Kluwer.
- Kratzer, A. (1998). More structural analogies between pronouns and tense. In D. Strolovitch and A. Lawson (Eds.), *Proceedings of SALT VIII*, Cornell, Ithaca, NY, pp. 92–110. CLC Publications.
- Krifka, M. (1992). Thematic relations as links between nominal reference and temporal constitution. In I. A. Sag and A. Szabolcsi (Eds.), *Lexical matters*, pp. 29–53. Stanford, CA: CSLI.
- Kruspe, N. (2004). *A grammar of Semelai*. Cambridge grammatical descriptions. Cambridge University Press.
- Kubozono, H. (1988). *The organization of Japanese prosody*. Ph. D. thesis, University of Edinburgh.
- Kubozono, H. (2011). Japanese pitch accent. In M. van Oostendorp and C. J. Ewen, E. Hume, and K. Rice (Eds.), *The Blackwell companion to phonology Vol 5. Phonology across languages*, pp. 2838–2907. Singapore: Blackwell Publishing Ltd.
- Kuno, S. (1973). *The structure of the Japanese language*. MIT Press.
- Kuno, S. (1987). Honorific marking in Japanese and the word formation hypothesis of causatives

- and passives. *Studies in Language* 11(1), 99–128.
- Kuroda, S. (1992). *Japanese Syntax and Semantics*. Kluwer Academic Publishers.
- Kuroda, S.-Y. (1965). *Generative grammatical studies in the Japanese language*. Ph. D. thesis, MIT.
- Kuroda, S.-Y. (1993). Lexical and productive causatives in Japanese: an examination of the theory of paradigmatic structure. *Journal of Japanese Linguistics* 15(1), 1–82.
- Kuroda, S.-Y. (2003). Complex predicates and predicate raising. *Lingua* 113, 447–480.
- Laka, I. (2006). Deriving split ergativity in the progressive: The case of Basque. In A. Johns, D. Massam, and J. Ndayiragije (Eds.), *Ergativity: Emerging Issues*, pp. 173–196. Kluwer.
- Landau, I. (2018). Missing objects in Hebrew: Argument ellipsis, not VP ellipsis. *Glossa* 1, 1–37.
- Larson, R. K. (1988). On the double object construction. *Linguistic Inquiry* 19, 335–391.
- Lasnik, H. (1981). Restricting the theory of transformations. In N. Hornstein and D. Lightfoot (Eds.), *Explanation in Linguistics*. London: Longmans.
- Lasnik, H. (1995a). Last resort. In S. Haraguchi and M. Funaki (Eds.), *Minimalism and linguistic theory*, pp. 1–32. Tokyo: Hituzi Syobo.
- Lasnik, H. (1995b). Verbal morphology: Syntactic structures meets the minimalist program. In H. Campos and P. Kempchinsky (Eds.), *Evolution and Revolution in Linguistic Theory: Essays in honor of Carlos Otero*, pp. 251–275. Georgetown University Press.
- Lasnik, H. (1999). Chains of arguments. In S. D. Epstein and N. Hornstein (Eds.), *Working Minimalism*, pp. 189–215. Cambridge, MA: MIT Press.
- Lees, R. (1961). *The phonology of Modern Standard Turkish*. Bloomington: Indiana University.
- Legate, J. A. (2014). *Voice and V: Lessons from Acehnese*. Cambridge, MA: MIT Press.
- Legate, J. A., F. Akkuş, M. Šereikaitė, and D. Ringe (2020). On passives. *Language, to appear*.
- Lewis, G. (1967). *Turkish Grammar*. Oxford: Oxford University Press.
- Li, C. N. and S. A. Thompson (1981). *Mandarin Chinese*. Berkeley: University of California Press.
- Li, Y. (1990). *Conditions on X⁰ movement*. Ph. D. thesis, MIT.
- Lipták, A. (2013). The syntax of emphatic positive polarity in Hungarian: evidence from ellipsis. *Lingua* 128, 72–92.
- Lipták, A. (2015). Identity in ellipsis: An introduction. *Lingua* 166, 155–171.
- Lodge, K. (1995). Kalenjin phonology and morphology: A further exemplification of underspecification and non-destructive phonology. *Lingua* 96, 29–43.
- Lohrmann, S. (2010). *The structure of the DP and its Reflex in Scandinavian*. Ph. D. thesis, University of Stuttgart.
- Lowenstamm, J. (2015). Derivational affixes as roots: Phasal spell-out meets English stress shift. In A. Alexiadou, H. Borer, and F. Schäfer (Eds.), *The syntax of roots and the roots of syntax*, pp. 230–259. Oxford: Oxford University Press.
- Makau, M. (1973). *Sentential Complementation in Japanese*. Tokyo: Kaitakusha.
- Marantz, A. (1984). *On the Nature of Grammatical Relations*, Volume 10 of *Linguistic Inquiry Monographs*. Cambridge, MA: MIT Press.
- Marantz, A. (1988). Clitics, morphological merger, and the mapping to phonological structure. In M. T. Hammond and M. P. Noonan (Eds.), *Theoretical Morphology*, pp. 253–270. Academic Press.
- Marantz, A. (1997). No escape from syntax: don't try morphological analysis in the privacy of your own lexicon. In A. Dimitriadis, L. Siegel, C. Surek-Clark, and A. Williams (Eds.), *University of Pennsylvania Working Papers in Linguistics*, Volume 4, pp. 201–225.

- Marantz, A. (2001). Words and things. Handout, MIT.
- Marantz, A. (2007). Phases and words. In S. H. Choe and et. al. (Eds.), *Phases in the theory of grammar*. Seoul: Dong In Publisher.
- Martin, S. E. (1952). *Morphophonemics of Standard Colloquial Japanese*. Ph. D. thesis, Baltimore, MD.
- Martinović, M. (2019). Interleaving syntax and postsyntax: Spellout before syntactic movement. *Syntax* 22(4), 378–418.
- Marvin, T. (2003). *Topics in the Stress and Syntax of Words*. Ph. D. thesis, Massachusetts Institute of Technology.
- Marvin, T. (2013). Is word structure relevant for stress assignment? In O. Matushansky and A. Marantz (Eds.), *Distributed Morphology Today: Morphemes for Morris Halle*, pp. 79–94. Cambridge, MA: MIT Press.
- Masica, C. P. (1993). *The Indo-Aryan Languages*. Cambridge University Press.
- Matsumoto, Y. (1996). *Complex predicates in Japanese: A syntactic and semantic study of the notion ‘word’*. Tokyo and Stanford: Kuroshio and CSLI.
- Matthewson, L. (2006). Temporal semantics in a supposedly tenseless language. *Linguistics and Philosophy* 29, 673–713.
- Matushansky, O. (2006). Head movement in linguistic theory. *Linguistic Inquiry* 37(1), 69–109.
- Mberri, N. E. (2002). *The categorical status and functions of auxiliaries in Shona*. Ph. D. thesis, University of Zimbabwe.
- McCawley, J. D. (1968). *The phonological component of a grammar of Japanese*. Mouton de Gruyter.
- McCawley, J. D. (1977). Accent in Japanese. In L. M. Hyman (Ed.), *Studies in Stress and Accent*, pp. 261–302. University of Southern California.
- McCawley, J. D. (1988). *The syntactic phenomena of English*. Chicago: University of Chicago Press.
- McCloskey, J. (1991). Clause structure, ellipsis and proper government in Irish. *Lingua* 85, 259–302.
- McCloskey, J. (2000). Quantifier float and wh-movement in an Irish English. *Linguistic Inquiry* 31(1), 57–84.
- McCloskey, J. (2011). The shape of Irish clauses. In A. Carnie (Ed.), *Formal approaches to Celtic linguistics*, pp. 143–178. Cambridge Scholars Publishing.
- McCloskey, J. (2017). Ellipsis, polarity and the cartography of verb-initial orders in Irish. In E. Aboh, E. Haeberli, G. Puskás, and M. Schönenberger (Eds.), *Elements of Comparative Syntax*, Volume 127 of *Studies in Generative Grammar*, pp. 99–151. Mouton de Gruyter.
- McElhanon, K. A. (1972). *Selepet Grammar: From Root to Phrase*. Number 21 in Pacific Linguistics. Ling. Circle of Canberra.
- Merchant, J. (2001). *The syntax of silence: sluicing, islands, and the theory of ellipsis*. Oxford: Oxford University Press.
- Merchant, J. (2008). An asymmetry in voice mismatches in vp-ellipsis and pseudogapping. *Linguistic Inquiry* 39, 169–179.
- Merchant, J. (2011). Aleut case matters. In E. Yuasa, T. Bagchi, and K. Beals (Eds.), *Pragmatics and autolexical grammar: in honor of Jerry Sadock*, Number 176 in *Linguistic Today*, pp. 193–210. John Benjamins.
- Merchant, J. (2013). Voice and ellipsis. *Linguistic Inquiry* 44, 77–108.
- Merchant, J. (2015). How much context is enough? two cases of span-conditioned stem allomorphy.

- Linguistic Inquiry* 46(2), 273–303.
- Merchant, J. (2018). Verb-stranding predicate ellipsis in greek, implicit arguments, and ellipsis-internal focus. In J. Merchant, L. Mikkelsen, D. Rudin, and K. Sasaki (Eds.), *A reasonable way to proceed: Essays in honor of Jim McCloskey*, pp. 229–269. University of California eScholarship.
- Meyers, S. P. (1990). *Tone and the Structure of Words in Shona*. New York: Garland Press.
- Miyagawa, S. (1998). (s)ase as an elsewhere causative and the syntactic nature of words. *J. of Japanese Linguistics* 16, 67–110.
- Mori, N. (2015a). *A syntactic structure of lexical verbs*. Koyo Shobo.
- Mori, N. (2015b). Syntax of vp ellipses and adverbial positions in japanese. pp. 155–172.
- Moskal, B. (2015). *Domains on the border: Between Morphology and Phonology*. Ph. D. thesis, University of Connecticut.
- Müller, G. (2004). Verb-second as vp-first. *Journal of Comparative Germanic Linguistics* 7, 179–234.
- Müller, G. (2017). Structure removal: An argument for feature-driven merge. *Glossa: A Journal of General Linguistics* 2(1), 28.
- Müller, G. (2018). Structure removal in complex prefields. *Natural Language and Linguistic Theory* 36, 219–264.
- Murphy, A. (Ed.) (2019). *Structure Removal*, Volume 94 of *Linguistische Arbeits Berichte*. Institut für Linguistik.
- Myler, N. (2014). *Building and Interpreting Possession Sentences*. Ph. D. thesis, NYU.
- Myler, N. (2016). *Building and Interpreting Possession Sentences*. Cambridge, MA: MIT Press.
- Nakajima, T. (1999). *Word order in the Minimalist Program: A derivational approach*. Ph. D. thesis, Cornell University.
- Nakau, M. (1984). Bun-fukusi-no hiakaku. In K. Kunihiro (Ed.), *Nichi-ei Hikaku Kooza*, Volume 2 Bunpoo, pp. 159–219. Taisyuu-kan syoten.
- Nedjalkov, I. (1997). *Evenki*. Descriptive Grammars. Routledge.
- Nespor, I. and I. Vogel (1986). *Prosodic Phonology*. Foris.
- Nevins, A. (2010). *Andrew Nevins*. MIT Press.
- Newell, H. (2008). *Aspects of the morphology and phonology of phases*. Ph. D. thesis, McGill.
- Newell, H. and G. Piggott (2014). Interactions at the syntax-phonology interface: Evidence from ojibwe. *Lingua* 150, 332–362.
- Newmark, L., P. Hubbard, and P. Prifti (1982). *Standard Albanian: A reference grammar for students*. Stanford UP.
- Ngonyani, D. (1996). Vp ellipsis in ndendeule and swahili applicatives. In E. Garrett and F. Lee (Eds.), *Syntax at Sunset, UCLA working papers in syntax and semantics*, Volume 1, pp. 109–128. Department of Linguistics, UCLA.
- Nilsen, O. (2003). *Eliminating positions*. Ph. D. thesis, University of Utrecht [published by LOT].
- Nishigauchi, T. (1993). Long distance passive. In N. Hasegawa (Ed.), *Japanese syntax in comparative grammar*, pp. 79–114. Tokyo: Kuroshio Shuppan.
- Nishiyama, K. (2010). Penultimate accent in japanese predicates and the verb-noun distinction. *Lingua* 120, 2353–2366.
- Nishiyama, K. (2012). Japanese verbal morphology in coordination. In *Workshop on Suspended Affixation*, pp. 1–13. Cornell: Cornell.
- Nishiyama, K. (2017). Phrasal compounds in japanese. In C. Trips and J. Kornfilt (Eds.), *Further investigations into the nature of phrasal compounding*, pp. 149–183. Language Science Press.

- Noda, H. (1984). Fukusi-no gojyun. *Nihongo Kyooiku* 52, 79–90.
- Nunes, J. and C. Zocca (2009). Lack of morphological identity and ellipsis resolution in Brazilian Portuguese. In J. Nunes (Ed.), *Minimalist essays on Brazilian Portuguese syntax*, pp. 215–236. John Benjamins.
- Ochi, M. (1999). Multiple spell-out and pf adjacency. In *Proceedings of the North East Linguistic Society 29*, University of Massachusetts, Amherst, pp. 293–306. GLSA.
- Ohso, M. (1976). *A study of zero pronominalization in Japanese*. Ph. D. thesis, Ohio State University, Columbus.
- Oku, S. (1998). *A theory of selection and reconstruction in the minimalist perspective*. Ph. D. thesis, University of Connecticut.
- Olawsky, K. J. (2006). *A grammar of Urarina*. Number 37 in Mouton grammar library. Mouton de Gruyter.
- Olson, M. (1975). Barai grammar highlights. In T. E. Dutton (Ed.), *Studies in languages of Central and South-East Papua*, pp. 471–512. Research school of Pacific Studies, Australian National University.
- Oshima, D. Y. (2014). On the morphological status of *-te*, *-ta*, and related forms in Japanese: Evidence from accent placement. *Journal of East Asian Linguistics* 23(3), 233–265.
- Otani, K. and J. Whitman (1991). V-raising and vp-ellipsis. *Linguistic Inquiry* 22, 345–358.
- Özçelik, O. (2014). Prosodic faithfulness to foot edges: the case of Turkish stress. *Phonology* 31, 229–269.
- Özsoy, S. (1988). Null subject parameter and Turkish. In H. Boeschoten and L. T. Verhoeven (Eds.), *Studies on Modern Turkish: Proceedings of the Third Conference on Turkish Linguistics*, Tilburg, pp. 82–91. Tilburg University Press.
- Öztürk, B. (2004). *Case, Referentiality, and Phrase Structure*. Ph. D. thesis, Harvard University.
- Palmer, F. R. (2001). *Mood and Modality*. Cambridge, UK: Cambridge University Press.
- Pancheva, R. (2003). The aspectual make-up of perfect participles and the interpretations of the perfect. In A. Alexiadou, M. Rathert, and A. von Stechow (Eds.), *Perfect explorations*, Interface Explorations, pp. 277–306. Mouton de Gruyter.
- Pancheva, R. and A. von Stechow (2004). On the present perfect puzzle. In *Proceedings of the North Eastern Linguistics Society Annual Meeting 34*, pp. 469–484.
- Parson, T. (1990). *Events in the Semantics of English*. Cambridge, MA: MIT Press.
- Perlmutter, D. (1978). Impersonal passives and the unaccusative hypothesis. *Berkeley Linguistics Society* 4, 157–189.
- Perlmutter, D. and P. Postal (1983). Some proposed laws of basic clause structure. In D. Perlmutter (Ed.), *Studies in Relational Grammar*, Volume 1, pp. 81–128. Chicago: University of Chicago Press.
- Perlmutter, D. and P. Postal (1984). The 1-advancement exclusiveness law. In D. Perlmutter and C. Rosen (Eds.), *Studies in Relational Grammar 2*, pp. 81–126. Chicago: University of Chicago Press.
- Philippaki-Warbuton, I. and V. Spyropoulos (1999). On the boundaries of inflection and syntax: Greek pronominal clitics and particles. In G. Booij and J. van Marle (Eds.), *Yearbook of Morphology 1998*, pp. 45–72. Dordrecht: Kluwer.
- Pierrehumbert, J. and M. Beckman (1988). *Japanese tone structure*. Cambridge, MA: MIT Press.
- Pietraszko, A. (2017). *Inflectional Dependencies: a study of complex verbal expressions in Ndebele*. Ph. D. thesis, U. of Chicago.

- Pietraszko, A. (2018). Auxiliary vs infl in bantu. the syntactic and phonological complexity of ndebele verbs. *Natural Language and Linguistic Theory* 36(1), 265–308.
- Pietraszko, A. (2019). Obligatory cp nominalization in ndebele. *Syntax* 22, 66–111.
- Platzack, C. (1986). Comp, infl, and germanic word order. In L. Hellan and K. K. Christensen (Eds.), *Topics in Scandinavian syntax*, pp. 185–234. Kluwer.
- Platzack, C. (2012). Cross germanic variation in the realm of support verbs. In P. Ackema, R. Alcorn, C. Heycock, D. Jaspers, J. Van Craenenbroeck, and G. Vanden Wyngaerd (Eds.), *Comparative Germanic syntax: The state of the art*, pp. 279–310. Amsterdam: John Benjamins.
- Platzack, C. (2013). Head movement as a phonological operation. In L. L.-S. Cheng and N. Corver (Eds.), *Diagnosing syntax*, pp. 21–43. Oxford University Press.
- Platzack, C. and A. Holmberg (1989). The role of AGR and finiteness. *Working Papers in Scandinavian Syntax* 43, 51–76.
- Pollock, J.-Y. (1989). Verb movement, universal grammar, and the structure of ip. *Linguistic Inquiry* 20, 365–424.
- Poser, W. J. (1984). *The phonetics and Phonology of Tone and Intonation in Japanese*. Ph. D. thesis, MIT.
- Pots, C. (2020). *Roots in Progress. Semi-lexicality in the Dutch and Afrikaans verbal domain*. Ph. D. thesis, KU Leuven.
- Pylkkänen, L. (2002). *Introducing Arguments*. Ph. D. thesis, MIT.
- Pylkkänen, L. (2008). *Introducing Arguments*. Cambridge, MA: MIT Press.
- Quirk, R., S. Greenbaum, G. Leech, and J. Svartik (1972). *A Grammar of Contemporary English*. London: Seminar Press.
- Ramchand, G. (2008). *Verb meaning and the Lexicon: A First Phase Syntax*. Cambridge: Cambridge University Press.
- Ramchand, G. and P. Svenonius (2014). Deriving the functional hierarchy. *Language Sciences* 46, 152–174.
- Reichenbach, H. (1947). *Elements of Symbolic Logic*. Macmillan & Co.
- Richards, M. (2011). On a-type discourse-configurationality in tagalog: Person prominence, case-agree and case-inheritance. Ms. University of Leipzig.
- Richards, N. (2004). The syntax of the conjunct and independent orders in Wampanoag. *International Journal of American Linguistics* 70(4), 327–368.
- Rizzi, L. (1978). A restructuring rule in italian syntax. In S. J. Keyser (Ed.), *Recent transformational studies in European languages*, pp. 113–158. MIT Press.
- Rizzi, L. (1982). *Issues in Italian Syntax*. Dordrecht: Foris.
- Rizzi, L. (1986). *Italian Syntax*. Reidel.
- Rizzi, L. (1990). *Relativized Minimality*. Cambridge: MIT Press.
- Rizzi, L. and I. Roberts (1989). Complex inversion in french. *Probus* 1(1), 1–30.
- Roberts, I. (1985). Agreement parameters and the development of English auxiliaries. *Natural Language and Linguistic Theory* 3, 21–58.
- Roberts, I. (1993). *Verbs and diachronic syntax: a comparative history of English and French*. Dordrecht: Kluwer.
- Roberts, I. (1998). have/be raising, move f, and procrastinate. *Linguistic Inquiry* 29, 113–125.
- Roberts, I. (2010a). *Agreement and Head Movement. Clitics, Incorporation, and Defective Goals*. Number 59 in Linguistic Inquiry Monographs. Cambridge, MA: MIT Press.
- Roberts, I. (2010b). A deletion analysis of null subjects. In T. Biberauer, A. Holmberg, I. Roberts,

- and M. Sheehan (Eds.), *Parametric Variation: Null Subjects in Minimalist Theory*, pp. 58–87. Cambridge: Cambridge University Press.
- Rohrbacher, B. (1994). *The Germanic VO Languages and the Full Paradigm: A Theory of V to I Raising*. Ph. D. thesis, UMass.
- Ross, J. R. (1967). *Constraints on variables in syntax*. Ph. D. thesis, MIT.
- Ross, J. R. (1969). Auxiliaries as main verbs. *Studies in Philosophical Linguistics 1*, 77–102.
- Rothstein, B. (2008). *The perfect time span: on the present perfect in German, Swedish and English*. Number 125 in *Linguistik Aktuell*. Amsterdam: John Benjamins.
- Rothstein, S. (1999). Fine-grained structure in the eventuality domain. *Natural Language Semantics 7*, 347–420.
- Rothstein, S. (2004). *Predicates and their subjects*. Springer.
- Roussou, A. and A. Tsangalidis (2010). Reconsidering the ‘modal particles’ in modern greek. *Journal of Greek Linguistics 10*, 45–73.
- Sadock, J. M. (1991). *Autolexical Syntax. A theory of parallel grammatical representations*. Chicago and London: University of Chicago Press.
- Sag, I. (1976). *Deletion and Logical Form*. Ph. D. thesis, MIT.
- Saito, M. (1985). *Some asymmetries in Japanese and their theoretical implications*. Ph. D. thesis, MIT.
- Saito, M. (1992). Long distance scrambling in Japanese. *Journal of East Asian Linguistics 1*, 69–118.
- Saito, M. (2006). Expletive replacement reconsidered: Evidence from expletive verbs in Japanese. In P. Brandt and E. Fuss (Eds.), *Form, structure, and grammar: A festschrift presented to Günther Grewendorf on occasion of his 60th birthday*, pp. 255–273. Berlin: Akademie Verlag.
- Saito, M. (2007). Notes on East Asian argument ellipsis. *Language Research 43*, 203–227.
- Sakai, H. (1998). Feature checking and morphological merger. In D. J. Silva (Ed.), *Japanese/Korean Linguistics*, Volume 8, Stanford, CA, pp. 189–201. CSLI Publications.
- Sakamoto, Y. (2016). Phases and argument ellipsis in Japanese. *Journal of East Asian Linguistics 25*, 243–274.
- Sakamoto, Y. (2017). *Escape from silent syntax*. Ph. D. thesis, University of Connecticut.
- Sakayan, D. (2007). *Eastern Armenian for the English-Speaking world*. Yerevan State University Press.
- Sakel, J. (1973). *A grammar of Mosestén*, Volume 33 of *Mouton Grammar Library*. Berlin, New York: Mouton de Gruyter.
- Santos, A. L. (2009). *Minimal answers. Ellipsis, syntax and discourse in the acquisition of European Portuguese*. Amsterdam/Philadelphia: John Benjamins.
- Sapir, E. (1921). *Language: an introduction to the study of speech*. Harcourt Brace.
- Sauerland, U. (1996). The interpretability of scrambling. In M. Koizumi, M. Oichi, and U. Sauerland (Eds.), *Proceedings of Formal Approaches to Japanese Linguistics 2*, Volume MITWPL 29, Cambridge, MA, pp. 213–234. MIT Working Papers in Linguistics.
- Sauerland, U. (1999). Erasability and interpretation. *Syntax 2*(3), 161–188.
- Sağ, Y. (2013). Copula in Turkish. In *Proceedings of the 8th Workshop on Altaic Formal Linguistics (WAFL8)*. MITWPL 67.
- Sawada, T. (2007). Strategies and choice in Japanese predicative inflection. Ms. UConn.
- Schäfer, F. (2017). Romance and Greek medio-passives and the typology of voice. In R. D’Alessandro, I. Franco, and A. J. Gallego (Eds.), *The Verbal Domain*, pp. 129–153. Oxford

- University Press.
- Schifano, N. (2015). The paradigmatic instantiation of tam: a novel approach to romance verb-movement. In E. Aboh, J. Schaeffer, and P. Sleeman (Eds.), *Romance Language and Linguistic Theory 2013. Selected papers from 'Going Romance'*, pp. 83–102. Amsterdam: John benjamins.
- Schifano, N. (2018). *Verb movement in Romance: A comparative study*. Oxford University Press.
- Schoorlemmer, E. and T. Temmerman (2012). Head movement as a pf-phenomenon: evidence from identity under ellipsis. In J. Choi, E. A. Hogue, J. Punskey, D. Tat, J. Schertz, and A. Trueman (Eds.), *West Coast Conference on Formal Linguistics 29*, Somerville, pp. 232–240. Cascadilla Press.
- Schütze, C. T. (2003). When is a verb not a verb. *Nordlyd 31*, 400–415.
- Selkirk, E. (1995). The prosodic structure of function words. In J. N. Beckman, L. W. Dickey, and S. Urbanczyk (Eds.), *Papers in Optimality Theory*, pp. 439–469. University of Massachusetts Occasional Papers 18.
- Selkirk, L. (1984). *Phonology and syntax: The relation between sound and structure*. Cambridge, MA: MIT Press.
- Sells, P. (1995). Korean and japanese morphology from a lexical perspective. *Linguistic Inquiry 26*, 277–325.
- Serova, K. (2019). Head movement, suspended affixation, and the turkish clausal spine. In P. Jeretič and Y. Sağ (Eds.), *Proceedings of the workshop on Turkic and languages in contact with Turkic*, Volume 4, pp. 89–103. LSA.
- Sezer, E. (1983). On non-final stress in turkish. *Journal of Turkish Studies 5*, 61–69.
- Shibata, Y. (2015). *Exploring Syntax from the interfaces*. Ph. D. thesis, University of Connecticut.
- Shibatani, M. (1973). Where morphology and syntax clash: A case in japanese aspectual verbs. *Gengo kenkyu 64*, 65–96.
- Shibatani, M. (1978). *Nihongo no Buneski [Analysis of Japanese]*. Taishukan Shoten.
- Shinohara, M. (2006). On some differences between the major deletion phenomena and japanese argument ellipsis. Ms. Nanzan University.
- Shwayder, K. (2015). *Words and Subwords: Phonology in a Piece-Based Syntactic Morphology*. Ph. D. thesis, University of Pennsylvania.
- Sigurðsson, H. A. (1993). The structure of the icelandic dp. *Studia Linguistica 47*, 177–197.
- Sims, A. D. and B. D. Joseph (2019). Morphology versus syntax in the balkan verbal complex. In I. Krapova and B. D. Joseph (Eds.), *Balkan Syntax and (Universal) Principles of Grammar*, Volume 285 of *Trends in Linguistics*. Mouton de Gruyter.
- Smith, C. (1991). *The Parameter of Aspect*. Kluwer.
- Smith, C. (2007). Tense and temporal interpretation. *Lingua 117*, 419–436.
- Sofroniou, S. A. (1962). *Modern Greek*. The teach yourself books. English Universities Press.
- Starke, M. (2018). Complex left branches, spellout, and prefixes. In L. Baunaz and K. D. Clercq (Eds.), *Exploring Nanosyntax*, pp. 239–249. Oxford: Oxford University Press.
- Stjepanovic, S. (1997). Vp ellipsis in a verb raising language and implications for the condition on formal identity of verbs. In J.-S. Kim, S. Oku, and S. Stjepanovic (Eds.), *'Is the logic clear?'* *Papers in Honor of Howard Lasnik*, Volume 8, pp. 287–306. University of Connecticut Working Papers in Linguistics.
- Stjepanovic, S. (1999). *What do second-position cliticization, scrambling and multiple wh-fronting have in common?* Ph. D. thesis, University of Connecticut.
- Strozer, J. R. (1976). *Clitics in Spanish*. Ph. D. thesis, University of California at Los Angeles.

- Sugioka, Y. (1984). *Interaction of derivational morphology and syntax in Japanese and English*. Ph. D. thesis, U. of Chicago.
- Sundaresan, S. and T. McFadden (2017). The articulated *v* layer: evidence from tamil. In R. D'Alessandro, I. Franco, and A. J. Gallego (Eds.), *The Verbal Domain*, Oxford studies in Theoretical Linguistics, pp. 153–178. Oxford University Press.
- Svenonius, P. (2004). On the edge. In D. Adger, C. de Cat, and G. Tsoulas (Eds.), *Syntactic edges and their effects*, pp. 261–287. Dordrecht: Kluwer Academic.
- Svenonius, P. (2005). Extending the extension condition to discontinuous idioms. *Linguistic Variation Yearbook 5*, 277–263.
- Svenonius, P. (2018). Delimiting the syntactic word. Paper presented at *Linguistics at Santa Cruz*.
- Swenson, A. (2017). *The morphosemantics and morphosyntax of the Malayalam Verb*. Ph. D. thesis, MIT.
- Takahashi, D. (2006). Apparent parasitic gaps and null arguments in japanese. *Journal of East Asian Linguistics 15*, 1–35.
- Takahashi, D. (2008). Quantificational null objects and argument ellipsis. *Linguistic Inquiry 39*, 307–326.
- Takahashi, M. (2011). *Some theoretical consequences of Case-marking in Japanese*. Ph. D. thesis, UConn, Storrs.
- Takano, Y. (2004). Coordination of verbs and two types of verbal inflection. *Linguistic Inquiry 35*, 168–178.
- Takit, K. (2011). an argument for argument ellipsis from *-sika* npis. In *Proceedings of NELS 39*, pp. 771–784. GLSA, Amherst.
- Tanaka, H. (2016). The derivation of *soo-su*: some implications for the architecture of japanese vp. *Japanese/Korean Linguistics 23*, 265–279.
- Tenny, C. (1987). *Grammaticalizing Aspect and Affectedness*. Ph. D. thesis, MIT.
- Terrill, A. (2003). *A Grammar of Lavukaleve*. Mouton de Gruyter.
- Thoms, G. (2012). ellipsis licensing and verb movement in scandinavian. Ms.
- Thoms, G. (2016). Short answers in scottish gaelic and their theoretical implications. *Natural Language and Linguistic Theory 34*(1), 351–391.
- Thoms, G. and C. Sailor (2018). When silence gets in the way: extraction from *do*-ellipsis in british dialects. In S. Hucklebridge and M. Nelson (Eds.), *Proceedings of NELS 48*, Volume 1, pp. 145–155. GLSA, Amherst.
- Thoms, G. and G. Walkden (2013). Vp preposing without remnant movement. Paper presented at the *2nd Cambridge Comparative Syntax Conference*.
- Thornton, A. (2017). Reduplicating verbal plurals cross-linguistically. to appear in Berkeley Linguistic Society Proceedings.
- Thornton, A. (2020). *Morphophonological & Morphosyntactic Domains*. Ph. D. thesis, University of Connecticut.
- Todorović, N. (2016). *On the Presence/Absence of TP: Syntactic Properties and Temporal Interpretation*. Ph. D. thesis, UConn.
- Todorović, N. and S. Wurmbrand (2017). Finiteness across domains. In T. Radeva-Bork and P. Kosta (Eds.), *Current developments in Slavic Linguistics – Twenty years after*. Peter Lang.
- Travis, L. (1984). *Parameters and effects of word order variation*. Ph. D. thesis, MIT, Cambridge, MA.
- Travis, L. (1994). Parameters of phrase structure and verb-second phenomena. In R. Freidin (Ed.),

- Principles and parameters in comparative grammar*, pp. 339–364. Cambridge, MA: MIT Press.
- Travis, L. (2000). The I-syntax/s-syntax boundary: Evidence from austronesian. In I. Paul, V. Phillips, and L. Travis (Eds.), *Formal Issues in Austronesian Linguistics*, pp. 167–194. Dordrecht: Kluwer.
- Travis, L. (2010). *Inner Aspect: The Articulation of VP*. Dordrecht: Springer.
- Truckenbrodt, H. (2006). On the semantic motivation of syntactic verb movement to c in german. *Theoretical Linguistics*, 257–306.
- Turan, U. (1995). *Null vs. Overt Subjects in Turkish Discourse: A Centering Analysis*. Ph. D. thesis, University of Pennsylvania.
- Tvica, S. (2017). *Agreement and Verb Movement. The rich agreement hypothesis from a typological perspective*. Ph. D. thesis, University of Amsterdam.
- Uriagereka, J. (1999). Multiple spell out. In S. Epstein and N. Hornstein (Eds.), *Working Minimalism*, pp. 251–282. Cambridge, MA: MIT Press.
- Van Craenenbroeck, J. and J. Merchant (2013). Ellipsis phenomena. In M. den Dikken (Ed.), *The cambridge handbook of generative syntax*, pp. 701–745. Cambridge: Cambridge University Press.
- Van Craenenbroeck, J., C. Pots, and T. Temmerman (2020). *Recent Developments in Phase Theory*. Number 139 in Studies in Generative Grammar. Mouton de Gruyter.
- van der Hulst, H. and J. van de Weijer (1991). Topics in turkish phonology. In H. Boerschoten and L. Verhoeven (Eds.), *Turkish linguistics today*, pp. 11–59. Leiden: Brill.
- van Urk, C. and N. Richards (2015). Two components of long-distance extraction: Successive cyclicity in dinka. *Linguistic Inquiry* 46(1), 113–155.
- Vicente, L. (2007). *The syntax of heads and phrases: A study of verb (phrase) fronting*. Ph. D. thesis, Leiden University.
- Vikner, S. (1995). *Verb movement and expletive subjects in the Germanic languages*. Oxford: OUP.
- Vogel, I. (1989). Prosodic constituents in hungarian. *Acta Linguistica Hungarica* 39(1/4), 333–351.
- Warner, A. R. (1986). Ellipsis conditions and the status of the english copula. *York Paper in Linguistics* 12, 153–172.
- Watanabe, Y. (1989). *The function of WA and GA in Japanese Discourse*. Ph. D. thesis, University of Oregon.
- Watters, D. E. (2002). *A Grammar of Kham*. Cambridge grammatical descriptions. Cambridge University Press.
- Weimer, H. (1972). Yareba verb morphology. *Te Reo, proceedings of the Linguistic Society of New Zealand* 15, 58–70.
- Weimer, H. and N. Weimer (1975). A short sketch of yareba grammar. In T. E. Dutton (Ed.), *Studies in languages of Central and South-East Papua*, pp. 667–729. Research school of Pacific Studies, Australian National University.
- Weisse, R. (1996). *The phonology of German*. Oxford: Clarendon Press.
- White, L. (2006). *A grammar book of Finnish*. Finn Lectura.
- Wiklund, A.-L., K. Bentzen, G. H. Hrafnbjargarsson, and T. Hróarsdóttir (2009). On the distribution and illocution of v2 in scandinavian *that*-clauses. *Lingua* 119(12), 1914–1938.
- Wiklund, A.-L., G. H. Hrafnbjargarsson, T. Hróarsdóttir, and K. Bentzen (2007). Rethinking scandinavian verb movement. *Journal of Comparative Germanic Linguistics* 10, 203–233.
- Williams, E. (2007). Dumping lexicalism. In G. Ramchand and C. Reiss (Eds.), *The Handbook of Linguistic Interfaces*, pp. 353–381. Oxford: Oxford University Press.

- Wojdak, R. (2005). *The linearization of affixes: Evidence from Nuu-chah-nulth*. Ph. D. thesis, University of British Columbia.
- Wurmbrand, S. (1998). Heads or phrase? particles in particular. In W. Kehrein and R. Wiese (Eds.), *Phonology and morphology of the Germanic Languages*, pp. 267–295. Tübingen: Max Niemeyer Verlag.
- Wurmbrand, S. (2001). *Infinitives: Restructuring and clause structure*. Berlin, New York: Mouton de Gruyter.
- Wurmbrand, S. (2004). Two types of restructuring—lexical vs. functional. *Lingua* 114(8), 991–1014.
- Wurmbrand, S. (2012a). Parasitic participles: evidence for the theory of verb clusters. *Taal en Tongval* 64, 129–156.
- Wurmbrand, S. (2012b). The syntax of valuation in auxiliary-participle constructions. In J. C. et al. (Ed.), *Coyote Working Papers: Proceedings of the 29th West Coast Conference of Formal Linguistics*, pp. 154–162. University of Arizona, Tuscon.
- Wurmbrand, S. (2013). Qr and selection: Covert evidence for phasehood. In S. Keine and S. Sloggett (Eds.), *Proceedings of NELS 42*, pp. 619–632. Amherst: GLSA.
- Wurmbrand, S. (2014). Tense and aspect in english infinitives. *Linguistic Inquiry* 45(3), 403–447.
- Wurmbrand, S. (2015). Restructuring cross-linguistically. In T. Bui and D. Özyıldız (Eds.), *Proceedings of the North Eastern Linguistics Society Annual Meeting 45*, Amherst, pp. 227–240. University of Massachusetts, GLSA.
- Wurmbrand, S. (2017). Verb clusters, verb raising, and restructuring. In M. Everaert and H. van Riemsdijk (Eds.), *The Blackwell Companion to Syntax 2*. Oxford: Blackwell.
- Wurmbrand, S. and M. Lohninger (2019). An implicational universal in complementation: Theoretical insights and empirical progress. In J. M. Hartmann and A. Wöllstein (Eds.), *Propositionale Argumente im Sprachvergleich: Theorie und Empirie*, Studien zur Deutschen Sprache, pp. 1–42. Gunter Narr Verlag.
- Yamada, A. (2019). Phase-based prosody: evidence from pitch-accent distribution in the japanese verbal domain. In M. Baird and J. Pesetsky (Eds.), *Proceedings of NELS 49*, Volume 3, Amherst, MA, pp. 305–318. GLSA.
- Yamaguchi, K. (2010). The difference in accentuation between the present and the past tenses of verbs in japanese. *Journal of Phonetic Society of Japan* 14(3), 1–10.
- Zanon, K. (2014). On the status of tp in turkish. *Studies in Polish Linguistics* 9(3), 163–201.
- Zeijlstra, H. (2012). There is only one way to agree. *The Linguistic Review* 29, 491–539.
- Zwart, J. (1993). *Dutch Syntax: a minimalist approach*. Ph. D. thesis, University of Groningen.
- Zwart, J. (1997). *Morphosyntax of Verb Movement*. Dordrecht: Kluwer Academic Publishers.