A Sentential Stress Parameter?

On Stress and Phasal Syntax: Evidence from French

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ABSTRACT.

This paper builds on prior research within the MP framework to add to the body of work that has already been completed on stress and phasal syntax (Legate 2003, Adger 2006, Kratzer and Selkirk 2007), re-examining Kahnemuyipour's (2004) phase-based account of sentential stress in Persian, English, Eastern Armenian, German, French, Spanish and Italian. I focus particularly on Kahnemuyipour's analysis of the French and Romance language data. I conclude that although his proposal is on track as far as the essential role of phases and multiple Spell-out in sentential stress assignment is concerned, his account of French data in particular leaves something to be desired. I propose that French data would be easily accounted for if we take the sentential stress rule to be parameterized, such that languages select which end of the assignment domain will be targeted for stress assignment. The hypothesis presented here makes a relevant contribution to discussion currently underway concerning derivation by phase and the nature of the syntax-phonology interface, specifically with regard to sentential stress assignment.

1. Introduction

1.1 The Minimalist Program – general background

1.1.1 Introduction

As with all areas of scientific inquiry, proposals and hypotheses in linguistics are subject to evaluation against considerations of theoretical elegance, naturalness, simplicity, and explanatory adequacy, among others. Although it would be incorrect to claim that the greater bulk of syntactic analyses in the generative tradition thus far have not been concerned with ideas theoretical elegance or simplicity, it is true that the different considerations mentioned above have not always carried equal weight with researchers in the field.

Reaching explanatory adequacy – that is, finding the solution to Plato's infamous problem; bridging the gap between poverty of the stimulus and acquired linguistic competence – was for many years the top priority of linguists working in generative grammar. Today, however, the development of the Principles-&-Parameters (P&P) theory of Universal Grammar (UG) means we are closer than ever before to attaining explanatory adequacy in syntax.

Once it was realized that explanatory adequacy was within our grasp, the next question became, where do we go from here? What theoretical territory could well lie 'beyond explanatory adequacy'? This is the new syntactic frontier that the Minimalist Program is currently seeking to explore.

1.1.2 Some core assumptions, principles, and goals

The Minimalist Program takes as its starting point certain basic facts about language – facts which, as has become clear over years of inquiry, any theory of grammar must somehow address, if it is to come anywhere near accounting for essential grammatical phenomena.

First, the Minimalist Program adopts the Principles-and-Parameters framework, according to which humans are in possession of an innate language faculty (FL), consisting of parameters whose values are set for a specific language during a child's language acquisition period. The values are selected based on the linguistic data accessible to the child during that time. As a result, the child is able to acquire the grammar of a specific language[1].

The Minimalist Program takes language to be defined by its very nature as a pairing of form[2] and meaning. This in turn implies that there has to be some sort of "interface" or contact zone between the grammar on one hand, and the conceptual-intentional (C-I) and articulatory-perceptual (A-P) cognitive systems on the other. The function of the C-I and A-P systems is to translate the abstract representational output of the grammar into speech. These spaces, where contact between the language faculty and the other cognitive systems takes place, might be called "interface levels," or, if one were to adopt a more GB-style terminology, "levels of representation." In any case, the interface/ representation levels Logical Form (LF*)*, which interfaces with the C-I system,

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[1] An acquired grammar G_L is defined as a language-specific set of parameter values. These values determine the rules according to which smaller parts of speech are assembled into larger constituents and phrases in a particular language.
[2] Form is understood here to denote sound, or, in the case of signed languages, gesture.

and Phonetic Form (PF), which interfaces with the A-P system, are conceptually necessary – meaning that they are required by the nature of language itself.

It is understood that the interface levels LF and PF place conditions of interpretability on the output of the grammar, such that certain constructions are considered convergent (i.e., interpretable), whereas other constructions may crash at one or another of the interface levels.[3] The core purpose of the Minimalist Program is to explore the hypothesis that language is the "optimal realization of interface conditions – a non-redundant and optimal system […] subject to economy considerations with a least effort flavor." (Hornstein, Nunes and Grohmann 2005:14) This hypothesis is known as the strong minimalist thesis.

One might ask, what does it mean for a theory to be subject to economy considerations of this type? In the following section, I will provide a brief overview of the minimalist understanding of theoretical economy, and some of the ways in which considerations of economy have affected the development of syntactic theory within the Minimalist Program.

1.1.3 The role of 'economy' in Minimalism

1.1.3.1 Main types of economy considerations

The Minimalist Program concerns itself with two main categories of economy conditions. The first category, known as methodological economy, comprises the "Occam's razor" type considerations of conciseness and simplicity, already familiar from other scientific disciplines. All other things being equal, an ideal theory is founded on as

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[3] Part of the minimalist project consists in determining what these bare output conditions on the output of syntax might be.

few primitive relations, theoretical entities, and separate modules as possible. Essentially, less is more.

The second set of principles belong to the substantive category of economy considerations. Substantive considerations are concerned with notions of "least effort," and these least effort notions are taken to be the most natural source for grammatical principles. (Hornstein, Nunes and Grohmann 2005:8) Examples of how substantive economy considerations affect minimalist models of grammar include such principles as Shortest Move, Greed, and Full Interpretation. [4]

1.1.3.2 Sub-types of economy considerations

Within the set of substantive economy considerations, there are two sub-types of economy principles that it is important to mention here, as they will play a substantial role later in chapter 2's discussion of phases and Multiple Spell-Out.

The first sub-type are the principles of representational economy. As previously mentioned in section 1.1.2, the Minimalist Program adopts the definition of a linguistic expression as a pair (π, λ) where π is a phonetic (PF) object and λ a semantic (LF) object. The principle of Full Interpretation referred to in the previous section is a principle of representational economy which requires all the features of the pair (π, λ) to be 'interpretable,' that is, to converge at the relevant interfaces, in accordance with bare output conditions. Thus, the set C of syntactic objects that are convergent – that is, that

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[4] I will not review the details of these principles here, for reasons of time and space. However, there have been several overviews of the Minimalist Program published in recent years which present the program's core concepts and hypotheses in a fairly accessible way, and which I would recommend to anyone interested in learning more about specific minimalist principles and the contexts in which they apply (see, for example, Boeckx 2006; Hornstein, Nunes and Grohmann 2005, among others).

are legible at both the LF and PF interfaces – is a subset of D, the set of all combinations permitted by the rules of the grammar.

Derivational economy is the second sub-type of economy considerations within substantive economy. These are essentially optimality considerations. Even when there is more than one possible convergent derivation generated by the grammar, only one of those outcomes will be considered grammatical by speakers. This is because after representational economy principles have selected the subset C of legible pairs (π, λ) from the larger set D of all the options generated by the grammar, principles of derivational economy then select from C among all convergent derivations[5] a subset A of admissible derivations which obey optimality considerations.

1.1.4 The process of sentence derivation

In previous sections (1.1.2, 1.1.3) I reviewed and discussed some of the assumptions and hypotheses of the Minimalist Program, including Principles-&-Parameters, and the conceptual necessity of the interface levels. At this point I will now discuss other assumptions and proposals of Minimalism that are specifically concerned with the process of sentence derivation.

The language faculty is taken to be composed of a lexicon – a type of memory bank where lexical items are stored – and a computational system. The computational system takes the items that are fed to it by the lexicon and arranges them to form a pair (π, λ), where π is a PF object and λ is an LF object. As discussed in the previous section,

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[5] Following leading analyses in the field, throughout this thesis I will be using the word *derivation* to refer to both the form/meaning pair (π, λ), as well as to the utterance (sentence, phrase, etc.) this pair represents.

this pair will be subject to interpretability conditions at LF and PF. (Hornstein, Nunes and Grohmann 2005: 15)

The first step in the derivation of a sentence is the selection of the numeration from the lexicon. The numeration is the set of all lexical items that are going to be Merged over the course of the derivation, with Merge being the structure-building operation whereby lexical items are combined to form phrases. This is, in fact, the next step in the derivation process: the merging of lexical items to form a hierarchical structure in accordance with the rules of Universal Grammar.

The structure is then checked to make sure it meets the interpretability requirements of the interfaces. The operation Move may be applied to satisfy Case or agreement requirements. According to the Copy theory of Movement, which I will be adopting in this thesis, Move is a complex operation resulting from the combined application of two smaller operations, Copy and Merge. From an economy perspective, the application of Move (i.e., Copy + Merge) is therefore more theoretically costly than the application of Merge alone. Thus, Move does not occur unless motivated by a need to satisfy interpretability requirements at LF and PF.

The operation Spell-Out occurs once all the items in the numeration have been Merged and all interface legibility conditions have been met. The derivation is then sent to the interfaces (where it will be transferred to the articulatory-perceptual and conceptual-intentional systems).

1.1.4 Summary

In this section, I have attempted to provide a broad overview of the concerns, goals and assumptions of the Minimalist Program. The core questions underlying the

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minimalist approach to syntactic theory are centered around concerns of optimality and derivational economy, and whether research revolving around these concerns could help us make the transition from an "adequate" theory of grammar, to an optimal one.

1.2 Summary of main proposals

In this thesis, I re-examine the phase-based theory of primary stress presented in Kahnemuyipour (2004), who proposes a stress assignment system which targets the left-most constituent in the Spell-out domain of a phase. I conclude that Kahnemuyipour is correct in taking phases and multiple Spell-out to be essential to stress assignment. However, I take issue with the precise formulation of his proposal as a universal left-most stress assignment rule, especially with regard to the data from French and other Romance languages. In light of the French examples, I propose a modified stress rule that would allow languages to select between left- and rightmost stress in a phase. I argue that this parameterization is necessary to account for all of the cross-linguistic data.

1.3 Scope and outline of thesis

This thesis is concerned with providing an account of sentential stress patterns in French at the phase level, in accordance with Kahnemuyipour (2004), who proposes that the domain of assignment for primary stress is the same as the Spell-out domain of the phase, with one stressed element per phase. It is important to note that this is different from previous accounts of nuclear stress, which have additionally concerned themselves with the issue of primary vs. secondary stress. In this thesis, I do not propose to account for the different hierarchical levels of sentential stress. I have therefore chosen to refer to

the type of stress I am discussing as "sentential" stress, rather than "primary" or "nuclear" stress. Also, though Kahnemuyipour (2004) and others (e.g., Zubizarreta 1998, Kratzer and Selkirk 2007) do discuss the relationship between stress and information structure, I will further limit my analysis to a discussion of stress assignment in focus-neutral contexts.

The first chapter is dedicated to providing an overview of the core concerns, goals and proposals of the Minimalist Program. Chapter 2 reviews some of the problems with phonological accounts of nuclear stress that led to the proposal of the first purely syntactic account in Cinque (1993). The third chapter zooms in on the notions of phases and multiple spell-out as proposed by Chomsky (2000, 2001) and Uriagereka (1999). Chapter 3 also discusses the advantages a phase-based account of stress such as Kahnemuyipour (2004) has to offer over other syntactic accounts (e.g., Cinque 1993, Zubizarreta 1998). Chapter 4 discusses remaining problems with Kahnemuyipour's (2004) analysis, and proposes parameterization of the primary stress rule as a solution to some of these issues. The fifth and final chapter is dedicated to concluding remarks, regarding the application of the sentential stress rule, the theoretical implications of parameterization, and some of the empirical challenges facing this proposal.

2. Syntax and stress assignment

2.0 Introduction

Bresnan (1971) was the first to propose the existence of a relationship between the hierarchical structure of a sentence, and the placement of nuclear stress in that sentence. Other analyses that have explored the plausibility of a syntactic account of

sentential stress include Cinque (1993), Zubizarreta (1998), and Kahnemuyipour (2004),

among others. Still others, beginning with Chomsky and Halle (1968), have preferred to

address sentential stress assignment as a purely phonological phenomenon, more akin to

the parallel stress assignment process that occurs at the word level.

Is a syntactic account of stress really necessary? In this chapter, I address that

question through a brief overview of non-syntactic attempts to account for sentential

stress assignment, beginning with Chomsky and Halle (1968), moving on to Halle and

Vergnaud's (1987) metrical grid, and ending with a short discussion of phrasal

phonology.[6] In so doing, I adopt Kahnemuyipour's (2004) argument that non-syntactic

accounts of phrasal and sentential stress are inadequate when it comes to achieving cross-

linguistic explanatory adequacy.

2.1 Why a syntactic account of stress?

As noted by Kahnemuyipour (2004), phonological approaches to stress

assignment do not succeed in achieving explanatory adequacy: they are unable to account

for certain empirical data.[7] For example, Chomsky and Halle's (1968) system assigned

nuclear stress to the last word in an English phrase or sentence. This accounted for the

sentence-final stress observed in most English sentences; however, it fails to account for

the sentence-initial stress we see in English passive and unaccusative constructions, such

as those in (1) and (2). (Throughout this thesis, stressed words are printed in bold face.)

(1) The **pizza** was delivered.

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[6] Due to time constraints, most of the discussion in this chapter is a summary of the second chapter of
Kahnemuyipour's (2004) phase-based account of sentential stress.
[7] Kahnemuyipour further notes that what makes these accounts "phonological" is that, although the
mechanisms they propose do make use of syntactic structure to predict stress patterns, all of these accounts
involve language-specific phonological rules which are ultimately responsible for stress assignment.

(2) A **dog** died.

Stress facts such as those in (1) and (2) are not predicted by a system that simply assigns nuclear stress to the last word in a phrase or sentence. However, as Kahnemuyipour (2004) points out, it is interesting to note that these exceptions to Chomsky and Halle's rule occur in constructions where the verb does not assign an external θ-role, and the subject of the sentence has moved to Spec-TP after being merged into the object position in the complement of VP. In fact, sentential stress in English and other languages (such as Persian, Scottish Gaelic, etc; see Kahnemuyipour 2004: 20) is consistently assigned to the object of the verb, or in the case of passive and unaccusative constructions, to another object-type constituent. This seems to indicate that sentential stress may be sensitive to the underlying hierarchical relationships between constituents.

Halle and Vergnaud (1987) attempt to integrate Chomsky and Halle's (1968) Nuclear Stress Rule into a metrical grid theory such as that which was originally proposed by Libermann (1975), using parameters to account for cross-linguistic variation in stress patterns. According to Kahnemuyipour (2004), the problem with this approach is that Halle and Vergnaud are attempting to take what was originally an analysis of word stress, and extend it to account for sentence stress as well. Nowhere near the same amount of cross-linguistic variation is found in stress patterns at the sentence level, as is found in stress patterns at the word level. Thus, the system proposed in Halle and Vergnaud (1987) fails in a different way from that of Chomsky and Halle (1968). Instead of failing to account for all of the empirical data, this rule overgenerates, predicting stress patterns that have not been found in natural languages (see Kahnemuyipour 2004: 28-29)

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2.3 Chapter summary

In conclusion, phonological accounts of stress at the sentence level have so far not been able to escape the overgeneration problem.[8] These accounts predict patterns of stress that have not been attested in natural language. Although it seems intuitive to suggest that if word-level stress assignment is governed by the phonological component, phrase/sentence-level stress should be also, a problem for this idea is that stress data across languages does not show nearly the same level of variation at the syntactic level as it does at the word level. However, phonological accounts proposed in the literature thus far would predict that it should.

Besides the ubiquitous overgeneration problem, there are certain characteristics common to stress facts across languages that virtually beg for a syntactic analysis. As generalized by Kahnemuyipour (2004), in a focus-neutral context, languages universally assign nuclear stress to the direct object of a simple transitive sentence.

(3) Johnny bit [his **sister**.]

(4) Ali [ye **ketaab**] xarid.   [Persian: Kahnemuyipour 2004:13]
   Ali a book   bought
   'Ali bought a book.'

(5) Chunnaic Se`onag **Calum**.   [Scottish Gaelic: Adger 2006:10]
   See-PAST Se`onag Calum
   'Se`onag saw Calum.'

Phrase stress consistently targets the direct object in SVO, SOV and VSO

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[8] A third type of account, which I do not discuss here, are the phrasal phonology approaches, such as Selkirk (1986) and Kahnemuyipour (2003). These allow for an interface between syntax and a phonological stress assignment system via mapping rules. I will refer the reader to Kahnemuyipour (2004) for a detailed discussion of these approaches and the challenges they face.

languages, represented here by English, Persian and Scottish Gaelic, respectively. These facts seem to indicate a universal sensitivity on the part of the stress rule to the underlying constituent structure of a sentence. For this reason alone, a syntactic analysis of higher-level stress assignment would be worthy of serious consideration. Also, as I discuss in section 3.2 of the next chapter, basing their analysis of phrase stress on syntax rather than phonology has enabled syntactic accounts to avoid the overgeneration problem which has plagued phonological analyses so persistently.

3. Phases and multiple Spell-out

3.0 Introduction

In Chapter 2, we saw that syntactic analyses of sentential stress – although they have a distinct advantage over phonological analyses in that they manage to eliminate problems with overgeneration – still fail to account for more than a narrow cross-section of data. For example, none are able to account for the Persian data from Kahnemuyipour (2004). However, Kahnemuyipour (2004) suggests that of we take the syntactic stress assignment rule to apply cyclically, adopting the theory of phases and multiple Spell-out as proposed in Chomsky (2000, 2001) and Uriagereka (1999), this allows us to solve some of the problems with earlier syntactic accounts.

In the first section of this chapter, I give a brief overview of the theory of phases and multiple Spell-out. Section 3.2 is a discussion of phase-based accounts of sentential stress. I conclude that although the concept of phases as stress-assignment domains

appears to be on the right track, there are problems with the theory that still need to be worked out.

3.1 Phases and Multiple Spell-Out

<u>3.1.0 Introduction</u>

In chapter 1, I summarized the core assumptions and hypotheses of the Minimalist Program, and in section 1.1.3, I particularly addressed the different operations that have been proposed to apply throughout the process of sentence derivation. I discussed, briefly, the selection of the numeration from the lexicon, which must occur before any application of the operations Merge or Move. I also discussed the role of the operation Spell-Out, which takes place once all interpretability conditions at the interfaces have been met through application of the operation Move.

However, due to the time and space constraints surrounding this undergraduate thesis project, my initial overview of these operations and of the theory behind them was mainly confined to a summary of the proposals themselves. In this section, I would like to take a closer look at the operation Spell-Out, as well as the idea of derivational economy. I will follow Chomsky (2000, 2001) and others in suggesting that closer examination of *Spell-Out* reveals certain inconsistencies between its manner of application, and broader minimalist concerns regarding derivational economy and the reduction of the computational burden. In conclusion, having reviewed the conceptual justification for a multiple Spell-out architecture (as proposed by Juan Uriagereka 1999), I will adopt Chomsky's hypothesis that a sentence's derivational structure is constructed cyclically in a phase-by-phase manner.

<u>3.1.1 The issues</u>

3.1.1.1 Spell-Out: Surface-structure in disguise?

In chapter 1, I talked briefly about the minimalist project of eliminating from the grammar every module, theoretical entity or level of representation that is not conceptually necessary. I mentioned that the Minimalist Program takes the interface levels LF and PF to be the only conceptually necessary levels of representation. They are required by the definition of language as a pairing of form and meaning.

Deep-Structure and Surface-Structure, on the other hand, are not conceptually necessary. Because of this, part of the minimalist project involves working to develop a theory of grammar which does not rely on either Deep- or Surface-Structure to account for empirical data.[9]

A problem arises when we come to the operation Spell-Out. Transfer of syntactic structure from the computational system to the interfaces must take place so that the derivation may be converted into a phonetically and semantically intelligible stream. Therefore, Spell-Out is conceptually necessary. However, if we take Spell-Out to be an operation that applies only once in the course of a derivation, shipping a sentence off to the interfaces after it has been made ready for interpretation, it begins to closely resemble something like an intermediate level of representation; in face, almost as if we still had S-structure but were just calling it by a different name ("spell-out"). Are we then forced to

[9] As the different modules of GB (e.g. Case theory, Theta theory, X-bar theory) rely heavily on the notions of D- and S-Structure, eliminating these levels of representation from the grammar means going back and looking again at all of these different modules to see if they can be explained without resorting to any levels of representation other than PF and LF. This has been done with some success. However, the details of these intricate analyses lie outside the scope of this thesis. Hornstein, Nunes and Grohmann (2005) is a fairly accessible overview of the relevant accounts – the authors guide the reader through each GB module and explain how the minimalist theories are able to account for the same data without resorting to D- or S-Structure.

conclude that an intermediate level of representation resembling S-Structure is conceptually necessary after all?

3.1.2 The computational burden of derivational economy

Derivational economy has been proposed to play a key role in determining which structures generated by the computational system will be convergent at LF and PF. It has been found that certain structures are ungrammatical for no other reason than that the operations applied in their derivation are more 'costly' than those applied in the grammatical derivation. It appears, then, that derivations actually compete with one another for convergence, and that considerations of derivational economy are an important factor in determining the winner of this competition. Only one of the potential convergent outcomes will be acceptable to speakers: the one that is the most derivationally economical.

The process of determining the winner of the economy competition has been proposed as follows: as a sentence is being constructed, the syntactic processor compares all the possible convergent derivations and chooses the most economical one to be Spelled-out. This is great until you think about the implications: the huge burden it places on the computational system. If the syntactic processor is going to properly compare alternative derivations, one would think that it would then need to be able to 'see' all of those possible derivations in their entirety before attempting to make a comparison. Well, if language is infinitely recursive, then what's going on is you are trying to compare a potentially infinite number of infinitely long sentences. It's not very efficient. In fact, if this is what happens in our minds every time we try to say something, it's pretty amazing that anyone ever manages to say anything at all.

3.1.3 Chomsky's solution

As a solution to the problems described above, Chomsky (2000, 2001) proposes that a derivation is not constructed all at once, but rather in installments, which he calls phases. Chomsky's intuition is based on the fact that even syntactic structures that are ultimately well-formed are not convergent at every point in the derivation. This suggests that there are specific stages in the derivation process at which the structure being built is evaluated for convergence.

The notion of the phase also fits in nicely with the idea of derivational economy, according to which - as discussed in the previous section - the computational system selects from a number of possible convergent derivations the one that is the least costly. Comparing many entire trees to one another would be a very complex and demanding task, but if we assume, as Chomsky does, that language takes into account "general considerations of computation efficiency" (Chomsky 2005) then it makes sense that the language faculty would seek to deal with this complex problem by breaking it down into more manageable chunks.

I will follow Chomsky (2000, 2001) and Kahnemuyipour (2004) in assuming CP and transitive or unergative vP to be the only phasal categories – unaccusative and passive v are taken not to induce Spell-Out.[10] Once a phase has been built, its complement VP or TP is Spelled-Out and sent to the interfaces where it is checked for convergence at LF and PF. After this happens, the Spelled-Out complement of the phase is no longer available to participate in operations. This is known as the Phase

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[10] For alternative approaches, see Legate (2003), which treats unaccusative/ passive vP as phasal, or Adger (2006), which also takes DP to be a phase.

Impenetrability Condition. Only the phase head and its projections, called the edge of the phase, remain available for further syntactic operations.

<u>3.1.4 Conclusion</u>

In this section, I have given an overview of the concepts and motivations underlying the theory of phases and multiple Spell-out. Cyclical Spell-out is partially motivated by the discovery that derivational economy plays a role in selecting between convergent derivations. From a minimalist perspective, this cyclicity is also conceptually attractive, as it eliminates any remaining resemblance between Spell-out and GB's S-Structure.

Having seen that phases and multiple Spell-out are conceptually motivated, the question now becomes, where do we see this in the data? No matter how attractive a concept might be, if we can't find "real-world" linguistic evidence to support it, we can't really be sure it actually exists.

Kahnemuyipour (2004) and others (Adger 2006, Kratzer and Selkirk 2007) propose that the theory of phases and multiple spell-out provides the key to developing a truly viable theory of sentential stress assignment, which accounts for stress patterns in a variety of languages without overgenerating. In the following sections, I will be taking a closer look at these proposals – particularly Kahnemuyipour (2004) – and their implications, both for the theory of phases and for theories of stress assignment.

3.2 Why a phase-based account of stress?

<u>3.2.0 Introduction</u>

In chapter 2, I discussed why a syntactic account of sentential stress could be a desirable thing and why the idea merits serious consideration. In this section, I want to begin talking about why a phase-based account of stress is better than a syntactic account that is

not based on the idea of phases as stress-assignment domains. In each of the following subsections, I will present a brief synopsis[11] of two recent syntactic accounts of nuclear stress: Cinque (1993) and Zubizarreta (1998). I follow Kahnemuyipour (2004) in concluding that while each of the two accounts has many strengths, they are both inadequate in other important respects.

3.2.1 Cinque (1993)

Cinque (1993) proposes a syntactic account of nuclear stress as a solution to the overgeneration problem of phonological accounts. A purely syntactic analysis helps explain the narrow variety in sentential stress patterns across languages, since these variations are now tied to variations in the syntactic parameter values instead of being themselves independently parameterized. Cinque's hypothesis is that nuclear stress is always assigned to the most deeply embedded constituent in a sentence. His claim makes sense, since nuclear stress usually falls on the object. However, since Cinque takes this rule to apply at S-Structure, his proposal does not account for English passive and unaccusative constructions, where the internal argument of the verb has moved to the subject position in [Spec-TP].[12] Another pointed criticism of Cinque's system, made by Kahnemuyipour (2004), is that it fails to account for Kahnemuyipour's data from Persian. As we will see in the next section, this is part of the reason that Kahnemuyipour (2004)

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[11] For a more detailed overview of these proposals, I will refer the reader to Kahnemuyipour's (2004) in-depth commentary and analysis.

[12] Legate (2003) later proposes a revised, phase-based analysis along the same lines as Cinque (1993) in an attempt to account for the problematic passive/ unaccusative data in English. By taking the stress-assignment rule to apply before movement operations, her proposal is able to solve this particular empirical problem. However, as noted by Kahnemuyipour (2004), this type of system would predict *wh*-objects (which undergo raising from a VP-internal position to the specifier of CP) to receive nuclear stress. This is part of the reason why Kahnemuyipour suggests that application of the stress rule takes place after movement operations.

proposes stress to be assigned to the left-most element in the stress domain, instead of the most embedded.

3.2.2 Zubizarreta (1998)

Part of Zubizarreta's work deals with the interaction between prosody and focus, and so lies outside the scope of this thesis, which addresses the assignment of phrasal stress in a focus-neutral context. In the part of Zubizarreta's account that discusses focus-neutral contexts, she proposes a modularized stress assignment system, in order to reconcile apparently conflicting core facts in Germanic and Romance languages. Zubizarreta suggests a modification of the Nuclear Stress Rule defined earlier by Cinque (1993). Her rule proposes dividing the stress assignment system into two separate modules, one of which takes into account selectional relations between categories (the "S-NSR"), while the other is sensitive to hierarchical relations between constituents (the "C-NSR"). According to her hypothesis, different languages give different modules of the NSR precedence in their stress assignment systems. This is how Zubizarreta accounts for differences between the core facts in her Germanic and Romance language data: Germanic stress assignment gives priority to selectional considerations whereas its Romance counterpart does not take selectional ordering into account and uses only the C-NSR.[13]

There are problems with Zubizarreta's analysis on both a conceptual and empirical level. Both are discussed in detail in Kahnemuyipour (2004). The main empirical

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[13] As noted by Prof. Donna Jo Napoli of Swarthmore College, although not explicated stated in terms of parameters, Zubizarreta's account is, essentially, a parameter-based account. Zubizarreta's insight will be useful to me in my own parameter-based analysis.

problem that Kahnemuyipour finds with Zubizarreta is that, like Cinque (1993), her proposal does not provide a satisfactory account of stress facts in Persian.

3.2.4 Conclusion

In this section, I have discussed syntactic accounts of phrase stress that do not make use of phases and multiple Spell-out. I also reviewed the advantages that these syntactic accounts have to offer over the phonological accounts discussed in chapter 2; mainly, that a syntactic analysis eliminates the overgeneration problem that phonological accounts have, if variations in stress patterns are linked to syntactic parameters instead of phonological ones. Because it predicts that cross-linguistic variation in the stress pattern must coincide with variation in constituent order – which is what was observed and generalized in Kahnemuyipour (2004).

We have also seen that just solving the overgeneration problem with a syntactic approach is not enough. All of the proposals reviewed in this section face empirical challenges, and Zubizarreta (1998) faces some conceptual issues as well.[14] In the next sections, we'll see how phase-based accounts are able to overcome these challenges, showing that phases are essential for stress assignment and thus providing substantial empirical justification for the notion of phases and multiple spell-out. (Even though these notions were initially proposed on independent grounds.)

3.3 Sentential stress: Phase-based syntactic accounts

As pointed out by Kratzer and Selkirk (2007), the simplest phase-based approach to stress assignment takes the phase itself to be the domain in which the phonological

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[14] the internal redundancy mentioned in Kahnemuyipour (2004)

stress assignment rule will apply. This is the approach followed by Adger (2006), whose grid-style proposal takes the highest stress in the spell-out domain (i.e., the complement of the phasal head) to project at the level of each phase. However, in order to make this work, Adger is forced to stipulate an extra phasal category, DP, in addition to the broadly assumed phases *v*P and CP.

Adger's account of nuclear stress requires repeated application of the revised Nuclear Stress Rule to material that has already been spelled out. He proposes that there must be some "store" which holds the information until it is eventually mapped to the interface in a single unit. This "store" that Adger describes sounds very much like some sort of intermediate, theory-internal level of representation, similar to the ones the MP has been working so hard to get rid of. Thus, from a conceptual perspective, there are some things about Adger's proposal that are somewhat questionable. One should wait until after other alternatives that are more in keeping with the Minimalist agenda have been investigated first, before considering this idea as a possible approach to stress assignment, .

In addition, as Kratzer and Selkirk (2007) mentions and Kahnemuyipour (2004) also points out, there is the fact that in a neutral context, phrase stress is universally assigned to the direct object of a transitive sentence. This is not predicted if the verb and the direct object are taken to be in the same domain for stress assignment: "Within that domain, prosodic theory would allow for either rightmost or leftmost placement of main phrase stress." (Kratzer and Selkirk 2007: 11)

Thus, Adger's proposal not only poses conceptual problems but also overgenerates, as it predicts that some languages would permit phrase stress to be assigned to a transitive verb even in a neutral context. Partly for these reasons, and partly

due to time and space constraints, I have chosen to assume that Kratzer and Selkirk's criticism is accurate, and I do not review Adger's (2006) account in any further detail in this thesis. Rather, I have chosen to concentrate on the analysis presented in Kahnemuyipour (2004). I conclude that while broad concept underlying Kahnemuyipour's proposal is probably on the right track, there are still some empirical kinks to be worked out – for example, with the French data from Zubizarreta (1998), which is the subject of the next chapter.

3.3.2 Kahnemuyipour (2004)

In his own words, Kahnemuyipour's thesis "explores the nature of sentential stress,[15] its manner of assignment, and its interaction with information structure." My main focus here is on the part of his thesis that explores the position of stress in informationally neutral phrases, as I have chosen not to address the interaction of syntax with information structure in this paper.

Kahnemuyipour proposes a reformulation of the rule governing sentential stress assignment, such that it is consistent with the theory of phases and multiple Spell-Out, as proposed by Chomsky (2000, 2001) and Uriagereka (1999). Following Chomsky, Kahnemuyipour takes CP and vP to be phasal categories. Kahnemuyipour also adopts Chomsky's (2000, 2001) hypothesis that unaccusative and passive v do not induce Spell-Out.

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[15] What Kahnemuyipour (2004) calls "sentential stress" is not clausal nuclear stress. Rather, it is essentially the same phenomenon that Kratzer and Selkirk (2007) call "phrase stress." I will adopt Kratzer and Selkirk's term for the remainder of the thesis, because I believe it distinguishes more clearly between systems like Kahnemuyipour's, which apply at the phrase (sentence) level, and others such as Cinque (1993) or Bresnan (1971) which apply at the *clause* level.

According to Kahnemuyipour's hypothesis, sentential stress is assigned cyclically at the phase level. Stress assignment takes place once per phase. It occurs after movement and targets the left-most ('highest') constituent in the Spellee of a phase after movement, making it the domain within which lower-level phonological stress rules will determine which specific syllable of which specific word will receive stress. The Spellee is what Kahnemuyipour calls the part of the phase that is spelled out – that is, the complement of the phase head. So, for example, the Spellee the vP phase, the Spellee is the VP and everything it contains. The phasal category head and its specifier (together known as the "edge" of the phase) are not spelled-out at this time.

To illustrate, let's take a look at Kahnemuyipour's proposal accounts for core English data, starting the simple transitive sentence in (#). The stressed constituent[16] is printed in bold face in the example sentence, and highlighted in the structural diagram. Phasal heads C and v, whose Merge induces the application of the operation Spell-Out to their complement TP or VP, are printed in green or blue, as are their corresponding Spell-out domains.

(6) a. Dwight grows **beets**.

b. [$_{CP}$ C [$_{TP}$ [$_{DP}$ Dwight] T [$_{vP}$ [$_{DP}$ ~~Dwight~~] v + [grows] [$_{AspP}$ [beets] Asp + [~~grows~~] [$_{VP}$ ~~grows~~ [$_{DP}$ ~~beets~~]]]]]

First, the verb merges with the direct object and builds VP. Then, merge of the phasal head v triggers Spell-out of the VP, but not before the verb has raised outside of the Spell-out domain to a position inside vP. (Recall that this part of the phase, called the

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16 Since Kahnemuyipour's rule is formulated such that stress is assigned within the highest constituent I have chosen throughout this thesis to highlight the entire constituent rather than just the stressed word. The point is that this constituent is a domain within which other stress rules will apply to determine which precise syllable of the word sister will ultimately receive nuclear stress. Kahnemuyipour is very clear about the scope of his rule: just predicting the domain.

edge, does not undergo Spell-out until the next higher phase.) Under the Copy theory of movement, the lower copy of the verb now becomes invisible to the phonetic component – it undergoes 'deletion at PF' to satisfy interpretability conditions at the interface, as does the lower copy of the object, which Kahnemuyipour takes to undergo raising to the specifier of an aspectual phrase AspP. When the VP is Spelled-out, stress assignment will target the left-most eligible constituent in the Spell-out domain: the direct object.

Kahnemuyipour's choice to formulate the rule as assigning stress to the left-most element in the phase, rather than the right-most (cf. Cinque 1993, Zubizarreta 1998, Legate 2003), is primarily motivated by his data from Persian, and from English passive and unaccusative constructions.

The key Persian data from Kahnemuyipour (2004) is reprinted here in (7).

[Persian: Kahnemuyipour 2004: 92]

(7) a. Ali [**ziyaad** dars mi-xun-e]
Ali a lot lesson dur.-read-3sg
'Ali studies a lot.'

b. Ali [**kam** qazaa xord]
Ali little food ate
'Ali ate little food (lit. Ali ate food a little.)'

c. Ali [**aarum** ketaab mi-xun-e]
Ali slowly book dur.-read-3sg.
'Ali reads slowly.'

d. Ali [**bad** futbaal baazi mi-kon-e]
Ali bad soccer play dur.-do-3sg
'Ali plays soccer badly.'

The facts from Persian are compelling and point strongly to 'left-most' stress assignment in a given stress domain. Kahnemuyipour shows that if we take this stress

domain to be the spell-out domain of the phase, the Persian facts are accounted for.[17] No prior, phase-less proposal for sentential stress has been able to account for Persian stress facts. The Persian data makes it apparent that phases and multiple Spell-out are essential to stress assignment, thus providing strong empirical justification for these notions, in addition to the other conceptual and empirical motivations discussed in Chomsky (2000, 2001).

This data is a large part of the reason why Kahnemuyipour's stress assignment rule is formulated to target the left-most constituent in the stress domain (that is, the Spell-out domain of a given phase.) Every time an element is added to the left of the verb, that element receives primary stress. If the rule were to target the right-most constituent (as Cinque 1993, Zubizarreta 1998, and Legate 2003 do), it would fail to predict this key characteristic of Persian stress.

English passive and unaccusative sentences provide another important reason why Kahnemuyipour suggests that the left edge of the Spell-out domain should be the target for primary stress. Recall that Kahnemuyipour follows Chomsky (2000, 2001) in assuming unaccusative and passive v not to induce Spell-out. Thus, in unaccusative/passive sentences, the VP is not Spelled-out until Merge of C.

(8) English: Passive

    a. **The pizza** was delivered.

    b. [$_{CP}$ **C** [$_{TP}$[$_{DP}$ the pizza] T + [was] [$_{vP}$ [$_{DP}$ ~~the pizza~~] v [$_{VP}$ [delivered]
    [$_{DP}$ ~~the pizza~~]]]]] [18]

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[17] I will refer the reader to Kahnemuyipour's own work for the details of his Persian analysis.
[18] Some analyses take the complement of a passive/ unaccusative verb to raise directly to [Spec, TP] rather than passing through [Spec, vP]. Either way, it doesn't affect the outcome of stress assignment, since the copy in [Spec, vP] would be deleted at PF, and thus would not be eligible to receive stress in any case.

(9) English: Unaccusative

    a. **A dog** died.

    b. [$_{CP}$ **C** [$_{TP}$ [$_{DP}$ a dog] T [$_{vP}$ [$_{DP}$ a dog] v [$_{VP}$ died [$_{DP}$ a dog]]]]]

In English passive and unaccusative sentences, the subject receives primary stress. As discussed in section 3.2.1, a stress assignment system such as that which was proposed in Cinque (1993) – which assigns primary stress to the rightmost element in the stress domain – fails to predict this fact. Legate (2003), in her attempt to revise Cinque's account to accommodate English passive and unaccusative data, runs into other empirical problems (cf. Kahnemuyipour 2004) However, assuming that the complement VP of unaccusative and passive v is not Spelled-out separately, but only with the rest of the TP at Merge of C, the facts in (8) and (9) can only be accounted for by a stress rule such as the one proposed by Kahnemuyipour, which takes phases to be the domain within which stress assignment takes place. Primary stress is assigned to the left-most constituent in the spell-out domain of the phase, which in the case of passive/ unaccusative constructions, translates for Kahnemuyipour to the left-most constituent in the TP: the subject DP.

Kahnemuyipour's proposal predicts sentence-final stress in English transitives, only because he assumes that the direct object raises to the specifier of a vP-internal aspectual phrase AspP. As Kratzer and Selkirk (2007) point out, by formulating the sentential stress rule to target the left-most constituent in the spell-out domain, Kahnemuyipour is forced to rely heavily on movement of the direct object to a higher position. Otherwise, his rule does not predict direct object stress: as illustrated below in (10), if the direct object

remains in position in the complement of VP, it is not the left-most constituent in the domain, but the right-most.[19]

(10) a. Dwight grows **beets**.

b. [$_{CP}$ **C** [$_{TP}$ [$_{DP}$ Dwight] T [$_{vP}$ [$_{DP}$ ~~Dwight~~] ***v*** + [grows] [$_{VP}$ ~~grows~~ [$_{DP}$ <mark>beets</mark>]]]]]

The solution Kratzer and Selkirk propose – what they call a "friendly revision" to Kahnemuyipour's stress assignment system – is that something like a Highest Phrase Condition is in effect, restricting the stress rule's application to phrases rather than constituents.

(11) ***The Highest Phrase Condition on prosodic spellout—stress-based version***
[Kratzer and Selkirk (2007)]

Assign phrase stress within the highest phrase within the spellout domain.

Thus, even if the verb is the leftmost constituent in the stress domain, it will not be eligible to be targeted for primary stress, since it is a head X^0 and not an XP.

This revision works well with Kratzer and Selkirk's German data. However, Kahnemuyipour's 'left-most stress' hypothesis, although perfect for Persian, still runs into a few problems when you consider English.

(11) English: Ditransitive

a. Dr. Horrible will lend his favorite videogame **to Penny**.

b. [$_{CP}$ **C** [$_{TP}$ [$_{DP}$ Dr. Horrible] T + [will] [$_{vP}$ [$_{DP}$ ~~Dr. Horrible~~] ***v*** + [lend]
[$_{VP}$ [$_{DP}$ his favorite videogame] ~~lend~~ [$_{PP}$ <mark>to Penny</mark>]]]]

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[19] Along these same lines, Kratzer and Selkirk also note that Kahnemuyipour's rule fails to predict sentence-final stress on PP in cases where the VP is a [V PP] type structure lacking a direct object. It does, however, correctly predict the lack of stress on PP in the presence of a direct object (Kratzer and Selkirk 2007: 11).

I will adopt Hale and Keyser's (1993) analysis of ditransitives, and follow other current leading analyses in assuming that in sentence (#), the argument PP [to Penny] is generated in the complement of VP, and the direct object [his favorite videogame] is generated in the specifier of VP.

Kahnemuyipour argues that this type of sentence is derived by movement of the goal to a position higher than *v*P, followed by the movement of the *v*P around it. (Recall that he also assumes movement of the direct object to [Spec, AspP].) This movement leaves the Spell-out domain of *v*P empty – and Kahnemuyipour claims arbitrarily that in cases like this, stress will be assigned to the closest phonologically non-null element.

Even if Kahnemuyipour is on track with his movement analysis – there is a deeper conceptual problem here, lying with the way that Kahnemuyipour is suggesting the stress assignment system functions when confronted with a phonologically empty stress domain.

If stress assignment really occurs at the phase-level – and the data from Persian would appear to indicate that it does – then this assignment should be occurring cyclically. Just as sentence derivation and Spell-out are taken to proceed "in a phase-by-phase manner," so too should stress assignment. So, when faced with a situation like Kahnemuyipour describes, a phonologically empty stress domain, the system should wait until the next cycle (i.e., the next phase) to apply the stress rule again.

Another problem with Kahnemuyipour's proposal has to do with his account of the Romance language data from Zubizarreta (1998). I will discuss the relevant issues and possible solutions in the next chapter.

3.4 Chapter summary

In this chapter, I provided a brief overview of the theory of phases and multiple spell-out, followed by the ways that this theory has been applied in analyses of primary stress assignment. I concluded that in Kahnemuyipour (2004), the Persian data serves its purpose well, as heavy evidence in favor of a phase-based account of sentential stress. In fact, accounts that are not phase-based fail to predict the Persian stress facts. This would seem to indicate that Kahnemuyipour is on the right track with his idea that the spell-out domain of a phase is also the domain within which the stress assignment system applies the syntactic stress assignment rule.

Although the concept behind Kahnemuyipour's proposal appears to be on the right track, there are still some conceptual and empirical kinks to be worked out. In the next chapter, I propose a possible solution to one of these problems: the issues Kahnemuyipour has with accounting for the core French data from Zubizarreta (1998).

Chapter 4: The case of French

4.1 French in Kahnemuyipour (2004)

4.1.0 Introduction

In Romance languages, stress is rightmost even in unaccusative/ passive sentences. Facts like those in (1) – (4) are a problem for Kahnemuyipour's hypothesis, because they are not readily predicted by a stress rule which assigns stress to the left-most element in the spell-out domain of a phase.

Ideally, the same system of sentential stress assignment would apply identically across languages, with variations in stress patterns arising from variations in syntactic structure rather than the stress assignment systems themselves. Kahnemuyipour chooses to explore the plausibility of this hypothesis. In order to do this, he starts from the assumption that the apparently conflicting stress facts arise from syntactic differences between Romance and other languages.

(12) Unaccusative: Italian and Spanish [V DPsubj]

   a. E' morto **un cane**.
     is dead one dog
     'A dog died.'

   b. Llegó **el correo**.   Spanish: Kahnemuyipour 2004: 142
     arrived the courier
     'The mail arrived.'

In Italian and Spanish, the order for unaccusative sentences is VS in a neutral context, and stress falls on the subject. Recall that because Kahnemuyipour is adopting Chomsky's (2000, 2001) hypothesis that unaccusative and passive *v* do not induce Spell-Out, the only stress domain in these sentences is the complement of the phasal head C. Under the standard assumption that VS order in Spanish and Italian unaccusatives is due to the subject remaining in its internal merge position in the complement of VP, rather than raising to Spec-TP as it does in English, Kahnemuyipour's stress rule would predict stress in sentences like those in (12) to fall on the verb, since it is the left-most element in the Spell-Out domain of CP. This can be seen from the structures in (13), where the predicted stress is highlighted; phasal categories are in bold face.

(13)a. * [CP **C** [TP T+ è morto [vP *v* + morto [VP morto [DP un cane]]]]]

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b. * [CP **C** [TP T + <mark>llegò</mark> [vP *v* + ~~llegò~~ [VP ~~llegò~~ [DP el correo]]]]]

In French, the order of the constituents in unaccusative constructions uttered in a neutral context does not differ from the canonical SV word order. (Unlike Spanish and Italian, in French there is no surface difference between the word order in unaccusative sentences and that of unergative sentences.)

(14) Unaccusative: French [DPsubj   V]

  a. Un   chien **est mort.**
    one   dog   is dead
    'A dog died.'

  b. Le courier **est arrivé**.   French: Zubizarreta 1998
    the   mail   is   arrived
    'The mail has arrived.'

Kahnemuyipour's proposed sentential stress rule would predict stress to be assigned to the subject of both the sentences in (14). As can be seen from the structures in (15), in both sentences the subject is the left-most element in the Spell-out domain of CP, recalling once again that Kahnemuyipour is assuming unaccusative and passive *v* not to induce Spell-Out.

(15) a. * [CP **C** [TP [DP <mark>un chien</mark>] T+ est mort [vP [DP ~~un chien~~] *v* + ~~mort~~ [VP ~~mort~~ [DP ~~un chien~~]]]]]
    b. * [CP **C** [TP [DP <mark>le courier</mark>] T+ est arrivé [vP [DP ~~le courier~~] *v* + ~~arrivé~~ [VP ~~arrivé~~ [DP ~~le courier~~]]]]]

To reconcile these facts with his stress system, Kahnemuyipour is forced to make two unusual proposals. The first is that in Romance languages, unaccusative verbs do induce

phasal boundaries. If we assume, as is standard, *v*-to-T raising in Romance languages, this will account for the Spanish and Italian unaccusative constructions: as the left-most phonologically non-null element in the lower stress domain, the subject in the complement of VP is now expected to receive stress.

(16) a. [CP **C** [TP   T+ è morto [vP   ***v*** + ~~morto~~ [VP ~~morto~~ [DP un cane]]]]]

   b. [CP **C** [TP T + llegò [vP ***v*** + ~~llegò~~ [VP ~~llegò~~ [DP el correo]]]]]

However, to account for French, where the word order in unaccusative sentences remains SV and stress falls on the verb, Kahnemuyipour has to make a second proposal. French *v* is phasal, as in Spanish and Italian, but unlike Spanish and Italian, the subject has moved out of *v*P into Spec-TP, so that the lower stress domain contains no phonologically realized elements. Since stress can only be assigned to a phonologically non-null element, there is no element inside of the lower stress domain which is able to receive stress.

Kahnemuyipour claims the account for cases like these is "straightforward": if the stress domain contains no phonologically non-null element, the stress rule will apply to the Spell-out domain of *v*P and stress will be assigned to the closest non-null element to the stress domain, which after *v*-to-T raising will be the verb in T.[20]

(17) a. [CP **C** [TP [DP un chien] T+ est mort [vP [DP ~~un chien~~] ***v*** + ~~mort~~ [VP ~~mort~~ [DP ~~un chien~~]]]]]

   b. [CP **C** [TP [DP le courier] T+ est arrivé [vP [DP ~~le courier~~] ***v*** + ~~arrivé~~ [VP ~~arrivé~~ [DP ~~le courier~~]]]]]

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[20] Whether there is further support for the idea that unaccusative verbs induce phasal boundaries in Romance is a question Kahnemuyipour leaves for future research.

This same "straightforward" analysis – which as discussed in section 3.3.2 is really not so straightforward at all – is also used to account for unergative stress patterns in Romance languages.

(18) Unergative: French

   a. Un   oiseau **chante**.
      one bird sings
      'A bird is singing.'

   b. [$_{CP}$ **C** [$_{TP}$ [$_{DP}$ un oiseau] T + chante [$_{vP}$ [$_{DP}$ ~~un oiseau~~] v + ~~chante~~ [$_{VP}$ ~~chante~~]]]]

In sentences such as (18), the subject and the verb both undergo raising operations and thus the lower stress domain contains no phonologically realized elements at Spell-Out. Kahnemuyipour suggests that application of the stress rule to the Spell-out domain of the lower phase vP will cause stress to be assigned to the verb, as the closest phonologically non-null element.

The problem with Kahnemuyipour's supposedly straightforward account is that it involves an unusual assumption about the stress rule's manner of application that is somewhat inconsistent with the whole cyclical, 'phase-by-phase' concept underlying the mechanics of Multiple Spell-Out architecture. Rather, one would expect something similar to what is described by Kratzer and Selkirk (2007): having applied vacuously to a domain containing no phonologically realized elements – the stress assignment rule must wait until the next higher phase so that it can apply to that stress domain.

For this reason, I propose that there is parameterization of the stress rule across languages – such that languages may select whether it is the left-most element in the

stress domain which receives stress (e.g., Persian), or alternatively, whether it is the right-most (e.g., French). Although Kahnemuyipour is able to jump through the Romance language hoop, as it were, and tweak his proposal such that the problematic data is more or less accounted for, the only way he is able to do so is by making several rather controversial, and in my opinion, inadequately justified assumptions. A left vs. right parameterization of stress assignment is more intuitive and requires less theoretical maneuvering. This type of parametric variation, if it does exist, would be completely consistent with the fundamental principles underlying the Principles-and-Parameters framework.[21] This hypothesis is developed in the following sections.

4.2 A left vs. right parameter?

4.2.0 Introduction

In this section, I expand on the intuition introduced in section 4.1: the hypothesis that there is a principle in UG governing stress assignment at the phase level, such that languages may select whether to stress the left- or right-most element in the Spell-out domain of the phase. My analysis here is focused on evidence from French. First, I review Kahnemuyipour's analysis of the French data. I then present evidence from French, showing how a parameterized account of stress makes it possible to predict French stress in a way that Kahnemuyipour (2004) does not. I conclude by discussing the

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[21] In his criticism of Zubizarreta (1998), Kahnemuyipour himself states that "typological differences are accounted for, in the generative tradition, by allowing variation along a parametric axis. That is a fundamental principle of the 'Principles and Parameters' framework." (Kahnemuyipour 2004: 78, footnote 29)

theoretical implications of a parameterized analysis, as well as some potential problems such an analysis may face.[22]

4.2.1 The context

First, let's recall how Kahnemuyipour's proposal analyzes stress for simple transitive sentences in French.

(19)a. Antoine mange **une tartine**.
    Antoine eats one tartine
    'Antoine is eating a piece of bread.'

b. [$_{CP}$ **C** [$_{TP}$ [$_{DP}$ Antoine] T + [mange] [$_{vP}$ [$_{DP}$Antoine] ***v*** + [mange] [$_{VP}$ [mange] [$_{DP}$ une tartine]]]]]

c. [$_{CP}$ **C** [$_{TP}$ [$_{DP}$ Antoine] T + [mange] [$_{vP}$ [$_{DP}$ Antoine] ***v*** + [mange] [$_{AspP}$ [$_{DP}$ une tartine] Asp + [mange] [$_{VP}$ mange [$_{DP}$ une tartine]]]]]]

Following Travis (1991, 1992) and others[23], Kahnemuyipour assumes object movement from the complement of VP to the specifier of AspP, a projection hypothesized to be *v*P-internal, between V and *v*. The structure in (19 c) is the one adopted in Kahnemuyipour (2004).

The main difference between the two structures in (19 b) and in (19 c) is the stress assignment domain of the lower phase *v*P. In both cases, this is the Spell-out domain of the phase, the complement of the phasal head *v*. However, in (19 c), this domain is larger

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[22] As noted by Prof. Donna Jo Napoli of Swarthmore College, this approach is analogous to the approach of metrical phonologists, such as Hayes (1995), on stress assignment – but Hayes' is at the lexical level, while mine is at the phasal level. Thus, we are making a link between stress assignment in the various different domains.

[23] also Borer (1994), Koizumi (1995), Megerdoomian (2002), and Jelinek and Carnie (2003), among others

and contains more information, with the object moving out of its base-generated position into the specifier of AspP – the left-most position in the stress domain.

For this thesis, I will follow more current analyses and adopt the structure in (19 b), assuming that the object of the verb is able to receive Case through the operation *Agree* thanks to a probe-goal relation with *v*. As a result, overt movement from the complement of VP to the specifier of a projection AspP is no longer required, at least not for purposes of Case assignment. In any case, this movement or lack thereof does not affect stress predictions for simple transitives. In both (19 b) and in (19 c), the object DP is the left-most phonologically realized element in the stress domain of the *v*P phase. It is also the right-most – since it is, in fact, all other elements contained in the *v*P phase of a simple transitive sentence are phonologically null. Thus, it's impossible to tell from a simple transitive sentence whether it really is necessary to have a 'right-most' parameter setting available to account for the French data – or if 'left-most' would do just as well. Obviously, we don't want to stipulate a parameterized stress rule if the data does not require it.

However, there are other French sentences that Kahnemuyipour (2004) has a more difficult time accounting for, such as those discussed in sections 4.2.4.

4.2.2 The issues

 One of the biggest stumbling blocks for Kahnemuyipour's proposal are the different French intransitive constructions.

(20)   Unaccusative: French
    a. Un   chien **est mort.**

one dog   is dead
'A dog died.'

b. [_{CP} **C** [_{TP} [_{DP} un chien] T+ <mark>est mort</mark> [_{vP} [_{DP} ~~un chien~~] *v* + ~~mort~~ [_{VP} ~~mort~~ [_{DP} ~~un chien~~]]]]]

c. Le courier **est arrivé**.   French: Zubizarreta 1998: **???**
   the mail   is arrived
   'The mail has arrived.'

d. [_{CP} **C** [_{TP} [_{DP} le courier] T+ <mark>est arrivé</mark> [_{vP} [_{DP} ~~le courier~~] *v* + ~~arrivé~~ [_{VP} ~~arrivé~~ [_{DP} ~~le courier~~]]]]]

(21) Passive: French

   a. Une maison **a été   cambriolée**.
      one house   has been   burglarized
      'A house was robbed.'
   b. [_{CP} **C** [_{TP} [_{DP} une maison] T+ <mark>a été cambriolée</mark> [_{vP} [_{DP} ~~une maison~~]
   v + ~~cambriolée~~ [_{VP} ~~cambriolée~~ [_{DP} ~~une maison~~]]]]]

   c. Marie a   été embrassée par **Jean**.
      M.   has been kissed   by J.
      'Marie was kissed by John.'

   d. [_{CP} **C** [_{TP} [_{DP} Marie] T+ a été embrassée [_{vP} [_{DP} ~~Marie~~]   *v* + ~~embrassée~~
   [_{VP} ~~embrassée~~ [_{DP} ~~Marie~~] [_{PP} <mark>par Jean</mark>]]]]]

As discussed in section 4.1.0, the unaccusative / passive facts are problematic because Kahnemuyipour (2004) predicts that sentential stress should be assigned to the subject in an unaccusative or passive sentence, where *v* is taken not to induce Spell-out and the subject is thus the left-most element in the stress domain. To reconcile the French unaccusative and passive facts with his stress system, Kahnemuyipour makes two proposals. The first is that in Romance languages, unaccusative and passive verbs induce phasal boundaries. The second is that if the stress domain contains no phonologically

non-null element, stress will be assigned to the closest non-null element to the stress domain.[24]

As discussed in section 4.2.1, the French (and more generally, Romance) unergative facts are also problematic for Kahnemuyipour (2004). The way they are accounted for in that analysis is somewhat inconsistent with the idea of 'phase-by-phase' cyclicity which underlies Uriagereka's (1999) Multiple Spell-Out architecture.

(22) Unergative: French

    a. Un   oiseau **chante**.
       one bird   sings
       'A bird is singing.'

    b. [$_{CP}$ **C** [$_{TP}$ [$_{DP}$ un oiseau] T + chante [$_{vP}$ [$_{DP}$ ~~un oiseau~~] v + ~~chante~~ [$_{VP}$ ~~chante~~]]]]

    c. Le bébé   **rit**.
      the baby laughs
      'The baby is laughing.'

    d. [$_{CP}$ **C** [$_{TP}$ [$_{DP}$ le bébé] T + rit [$_{vP}$ [$_{DP}$ ~~le bébé~~] v + ~~rit~~ [$_{VP}$ ~~rit~~]]]]

Again, if the phrasal stress assignment rule were parameterized in Universal Grammar, and French was allowed to select the right-most element in the Spell-out domain to receive stress, the unergative facts would be seamlessly accounted for.

4.2.3 The solution?

Sentence-final stress in all of the structures in (#) and (#) would be readily accounted for if we assume that stress assignment is parameterized, and that the language may select whether to assign stress to either the left- or right-most element in a phase, with French

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[24] I will refer the reader back to section 4.1.0 for a discussion of the various problems with this analysis.

having selected 'right-most' parameter setting. This hypothesis accounts for right-most stress in all of the passive, unaccusative and unergative constructions that proved to be problematic for Kahnemuyipour (2004), without resorting to any additional proposals or stipulations. There would be no need for phasal heads to behave differently in different languages. We could maintain the hypothesis CP and vP are phases in Universal Grammar, and that unaccusative and passive v do not induce Spell-out in any language.

Also, through parameterization of the stress rule, our theory of stress assignment can remain consistent with the cyclical nature of phases and multiple spell-out. The parameterization makes it possible to revise the idea of what happens when the stress rule applies vacuously: we can now say that when a domain contains no phonological material, the stress assignment system must wait until the next higher phase to apply the nuclear stress rule within the spell-out domain of that phase.[25]

4.2.4 Further evidence

Kahnemuyipour (2004) observed that in Persian, when any number of adjuncts or arguments are added to the left of the verb within the spell-out domain of the vP phase, the left-most of these elements will be targeted for primary stress. This is why he proposes a rule which universally targets the left-most element in the spell-out domain for primary stress assignment. This phenomenon is also observable in French, only it occurs in the opposite direction. Whenever adjuncts or arguments are added to the right of the verb, the right-most of these will be targeted for primary stress.

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[25] This is somewhat similar to the idea of spell-out domain "skipping" discussed in Kratzer and Selkirk (2007). However, for Kratzer and Selkirk, it is possible to "skip" spell-out domains even when they contain phonological material. While theirs is an interesting proposal, this thesis makes no argument either against or in favor of it.

(23) a. Antoine   a   acheté   **un livre**.
       Antoine has bought a book
       'Antoine bought a book.'

   b. [CP **C** [TP [Antoine] T + [a acheté] [vP [Antoine] **ν** + [acheté] [VP [acheté]

[DP <mark>un livre</mark>]]]]]

(24)a. Antoine a prêté   un livre **à Marie**.
      Antoine has loaned   a book to Marie
      'Antoine loaned Mary a book.'

   b. [CP **C** [TP [Antoine] T + [a prêté] [vP [Antoine] **ν** + prêté [VP [DP un livre]

[prêté [PP <mark>à Marie</mark>]]]]]]

(25)a. Antoine a acheté   un livre   écrit   par **son professeur**.
      Antoine has bought   a book written by his professor
      'Antoine bought a book written by his professor.'

   b. [CP **C** [TP [Antoine] T + [a acheté] [vP [Antoine] **ν** + [acheté] [VP [acheté]

[DP [un [livre [VP écrit [PP par [DP <mark>son professeur</mark>]]]]]]]]

(26)a. Antoine a prêté   à Marie un livre   écrit   par **son professeur**.
      Antoine has loaned to Marie a book   written by his professor
      'Antoine loaned Mary a book written by his professor'

   b. [CP **C** [TP [Antoine] T + [a prêté] [vP [Antoine] **ν** + [prêté] [VP [PP à Marie]

[prêté] [DP [un [livre [VP écrit [PP par [DP <mark>son professeur</mark>]]]]]]]]

(27) a. Antoine a prêté   à Marie un livre écrit   par son professeur de littérature.
       Antoine has loaned to Marie a book written by his professor   of literature

africaine francophone de **l'époque   coloniale**.
African francophone of the-period colonial

   'Antoine loaned Mary a book written by his professor of francophone African
literature from the colonial period.'

b. [CP **C** [TP [Antoine] T + [a prêté] [*v*P [~~Antoine~~] ***v*** + [~~prêté~~] [VP [PP à Marie] [~~prêté~~] [DP [un [livre [VP écrit [PP par [DP son professeur [PP de [DP littérature africaine francophone [PP de [DP l'époque coloniale]]]]]]]]]]]]

The sentences in (23)-(27) show that whenever arguments or adjuncts are added to the right of the verb within the *v*P phase, the right-most of these will be assigned primary stress. This fact makes it very apparent that a stress rule which targets the left-most element in the spell-out domain cannot hope to account for French data.

Although the analysis of a broad cross-section of data from other Romance languages lies outside the scope of this thesis, which as stated earlier is focused on accounting for French stress facts, a passing glance at the Spanish and Italian data reveals that stress facts in these languages also point toward the existence of a 'right-most' parameter.

(28) Unaccusative: Italian and Spanish [V DP$_{subj}$]

  a. E' morto **un cane**.
    is dead one dog
    'A dog died.'

  b. a. [CP **C** [TP T+ è morto [*v*P ***v*** + ~~morto~~ [VP ~~morto~~ [DP un cane]]]]]

  c. Llegó **el correo**.   Spanish: Kahnemuyipour 2004: 142
    arrived the courier
    'The mail arrived.'

  d. [CP **C** [TP T + llegò [*v*P ***v*** + ~~llegò~~ [VP ~~llegò~~ [DP el correo]]]]]

One can see from the data in (6) that if we allow the UG stress assignment rule to be parameterized left vs. right, then it will be possible to account for Spanish and Italian

unaccusative constructions without stipulating that unaccusative *v* is phasal in those languages.

4.4 Chapter summary and conclusion

In this chapter, I presented the account of French and other Romance language data from Kahnemuyipour (2004), showing that much theoretical maneuvering is required to reconcile Kahnemuyipour's 'left-most stress' hypothesis with Romance language facts.

I suggested that French examples would be more easily accounted for if the theory allowed French to stress the right-most element in the phase Spell-out domain, instead of the left-most. I discussed core French examples and how they support this hypothesis, and also presented other evidence in favor of parameterization. Some of the questions and problems the parameterization hypothesis gives rise to will be discussed in chapter 5.

Chapter 5: Concluding remarks

Though it's clear that the domain for sentential stress assignment is determined by syntactic structures and phenomena, that is, phases and multiple spell-out, it is uncertain whether the rule actually does take into account the inner hierarchical structure within that domain.

'Highest vs. lowest' and 'first vs. last' give the same superficial results if one is adopting Kayne's (1994) Linear Correspondence Axiom, as most current minimalist analyses do. However, the underlying concepts are quite different. 'Highest vs. lowest' stress assignment implies a relationship to the inner hierarchical structure of the stress

domain, whereas 'first vs. last' simply suggests that the stress rule is sensitive to the linear ordering of constituents.

What happens when a structure is Spelled-out? It is sent to the interfaces LF and PF, for semantic and phonetic interpretation, respectively. Clearly the stress assignment rule doesn't have anything to do with what happens at the semantic interface, so let's leave LF out of the picture for now. If PF is where we need to be looking, then, the next question is: what happens at PF? Extraneous copies of moved elements are deleted, and the structure is linearized in accordance with the Linear Correspondence Axiom (LCA). The two-dimensional hierarchical structure is reduced to a one-dimensional string. PF is all about reduction and simplification. Therefore, for the time being, it seems more natural to think of the stress parameter in terms of 'first vs. last' or 'left-most vs. right-most,' rather than 'highest vs. lowest.'

The interesting part about a 'first vs. last' type of parameterization is that its scope is then potentially broad enough to govern stress assignment at multiple levels of the phonology. Consider French, for example, where the same pattern of 'right-most' stress assignment is observable at the word, phrase, phase, and sentence levels.

A proposal that has each language select between either a left-most or right-most parameter for stress assignment opens up a big empirical question: which parameter does each language select? For a language like English, where stress is final in transitive and unergative sentences, but initial in unaccusative and passive constructions, the answer to this question is not immediately apparent. Based on stress behavior in passives and unaccusatives without a medial phase boundary at vP, and also on stress patterns at the word level in English, one might hypothesize that English has selected the left-most

parameter for stress assignment. Or perhaps all *v*'s are phasal and English is a right-most stressed language. This is a question I leave for future research.

In conclusion, this thesis shows that the notions of phases and multiple Spell-out are empirically justified, in that they play an essential role in the assignment of sentential stress. Syntax, therefore, is important for stress assignment insofar as it helps to determine the domain in which the stress rule will be applied.

To account for data from French and other Romance languages, I proposed a parameterization of the sentential stress rule such that languages select between either left- or right-most stress, within the Spell-out domain of the phase. I further suggested that this parameter selection could potentially affect stress assignment at more than one level of phonological representation.

I did not find Kahnemuyipour's (2004) hypothesis, that sentential stress is assigned based on underlying constituent structure, to be empirically justified in the data. Rather, it seems more likely that the stress rule applies at PF, after extraneous copies of moved elements have been deleted from the phonological representation and the structure has been linearized – and that stress assignment is ultimately more concerned with linearity than with structural hierarchy.

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