

ABSTRACT

Coordination: A view from syntactic theory and second language acquisition

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This thesis aims to fill the gaps in two distinct, but related, areas of linguistic theory with respect to coordination. From the perspective of syntactic theory, I argue that all previous approaches to the syntactic structure of coordination fail to describe the universal properties of such constructions. To remedy this, I propose a new structure that will be demonstrated to be capable of deriving all of the universal properties of coordination. From the perspective of second language acquisition, the results of an experimental study investigating the coordinate structure prosody used by native English-speakers when speaking Japanese will show that L2 Japanese speakers learn a crucial difference between Japanese and English coordinate structures earlier than initially expected and without explicit instruction, revealing that although L2 learners transfer certain prosodic structures from their native language to their second language at first, they use the L2 prosody exclusively after their first year of study. Finally, I discuss the implications of both aspects of the thesis for syntactic theory and second language acquisition.

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COORDINATION: A VIEW FROM SYNTACTIC THEORY AND SECOND
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CHAPTER ONE

Introduction

1. Outline of the thesis

This chapter serves as a general introduction to the topics explored in this thesis. In this first section, I establish an outline of the thesis, summarizing the main points of each chapter as well as the main results and conclusions. In the second section of this chapter, I provide an overview of the phenomenon of coordination and describe the properties that coordinate structures in all attested languages possess, as well as some properties that have been alleged to be universal but actually appear to be subject to cross-linguistic variation. This information will serve as the basis for the work in later chapters. The third section concludes this chapter, and sets the stage for the theoretical and experimental work discussed in chapters two and three of the thesis.

In chapter two, I will be concerning myself with the syntactic structure of coordination. I will begin by introducing the framework of analysis, the Minimalist Program (MP), initially as set forth in Chomsky (1995). Then, I will examine the most prominent previous syntactic analyses proposed in the Minimalist literature, including some influential analyses from the period immediately preceding and continuous with the Minimalist Program, Government and Binding theory (GB). These analyses include the flat structure analysis that was standard before Chomsky (1995), the Spec-Head analysis proposed by Kayne (1994), Johannesen (1998), and Zhang (2010), and the adjunction-based analysis of Munn (1993). Based on the universal and language-specific properties

of coordination described in section 1.2 below, I will argue that, although Munn's (1993) analysis is superior to the other analyses, all of these analyses are insufficient for describing the syntax of coordination. I will then propose that the adjunction analysis of Munn (1993) can be augmented with the theory of decomposed Merge, proposed in Hornstein (2009), and that this analysis is capable of describing all of the universal syntactic properties of coordination.

In the third chapter, I explain the purpose, methodology, and results of an experimental study of the acquisition of Japanese coordinate structure prosody by native English-speaking students currently enrolled in formal Japanese classes. The study will attempt to address the following two questions: 1) whether second language learners of Japanese make use of English prosody or Japanese prosody when using coordinate structures in speech in their second language, and 2) whether or not there is a relationship between amount of classroom experience learning the language and type of prosodic structure used (English type prosody vs. Japanese type prosody).

The fourth and final chapter will tie the two main focuses of the thesis together by arguing that the proposed syntactic analysis of coordination and the results of the second language acquisition study have important implications for one another. In particular, I will argue that the results of the study are in line with the predictions of a model like the one proposed in chapter two that not only allows for cross-linguistic variation in the prosody of coordinate structures, but also allows for such variation to be learnable in the first place. I will further note the potential implications of the experimental study for foreign language education and consider some of the possible pedagogical factors that may have affected the results of the study. I will conclude by noting the limitations of

both the syntactic analysis and the second language acquisition study, and will provide suggestions for future research that could lead to more accurate data and increased empirical coverage.

2. *The properties of coordination*

Coordination is a major characteristic of all natural languages. According to Haspelmath (2000), coordination is defined as a “syntactic construction in which two or more units of the same type are combined into a larger unit and still have the same semantic relations with other surrounding elements” (1). In English, this definition applies to constructions which make use of words like *and*, *or*, and *but*, which share a number of syntactic properties. Constructions containing coordinators are known as *coordinate structures*. Coordination exhibits three main universal properties, namely iterativity, embedding, and an asymmetric relationship between the coordinator and one of the conjuncts.

First of all, coordination is iterative, meaning there is no limit to the number of conjuncts in a coordinate structure. For example, any native speaker of English intuitively understands that they could add to the list in (1) indefinitely.

- (1) a. Bob
 b. Bob and Joe
 c. Bob and Joe and Steve
 etc.

Indeed, the iterative nature of coordination is a major contributor to the discrete infinity that characterizes natural language.

Coordination also allows recursive embedding; that is, coordinate structures can be embedded within other coordinate structures, as in (2).

(2) The two teams are John and Dave, and Joe and Steve

Additionally, the embedding property of coordination allows for different semantic interpretations of the same string of words. Consider (3) and (4) below.

(3) Bob, and Joe and Steve fought against each other.

(4) Bob and Joe, and Steve fought against each other.

In (3), it is understood that Bob is fighting against Joe and Steve as a group, while in (4), Bob and Joe form a group that fights against Steve.

Finally, coordination is universally asymmetric. At least as early as Ross (1967), it has been noted that there is an asymmetric relation between the coordinator and one of its conjuncts. That is, in a coordinate structure with two conjuncts, the coordinator and one of the conjuncts (called the internal conjunct) form a unit to the exclusion of the other conjunct (called the external conjunct). Other linguists have argued for the existence of this asymmetric relationship based on prosody (Ross 1967), extraction, and binding (Munn 1993). The ordering of these elements with respect to each other is subject to cross-linguistic variation¹. Haspelmath (2000) notes the following ordering possibilities, where “E” stands for external conjunct, and “I” stands for internal conjunct².

(5) E co-I: Most Indo-European Languages, Arabic

¹ This fact was also noted in Ross (1967), in which it is stated that “the conjunction should be understood as preceding all its conjuncts, as in English, French, etc., or as following them, as in Japanese.”

² Haspelmath himself only uses the letters “A” and “B.” I have chosen to use abbreviations of external and internal conjunct here for explanatory ease.

I-co E: Japanese, Korean, Amharic

E I-co: West Greenlandic, Sanskrit

Interestingly, there appears to be a relationship between the linear order of the elements of a coordinate structure and the dominant head directionality of a particular language. As such, in head initial languages like English, the internal conjunct follows the coordinator, and the unit formed by them follows the external conjunct, as in (6).

(6) John went to the movies, and Alex went home

On the other hand, head-final languages like Japanese tend to exhibit the opposite order: the internal conjunct precedes the coordinator, and the unit formed by them precedes the external conjunct, as in (7). This is even more apparent in the case of clausal coordination, in which the coordinator morpheme *-te* is suffixed to the verb, as in (8).

(7) *neko-to inu-ga ie-ni iru* (Japanese)

cat-and dog-NOM house-in be

‘The cat and the dog are in the house’

(8) *Hiro-wa depaato-ni itte, miruku-o katta*

Hiro-TOP store-to go-and milk-ACC bought

‘Hiro went to the store and bought milk’

Beyond these three core phenomena, there are also a number of other properties that characterize coordinate structures in many languages, some of which have been argued to be universal. Particularly well-known among these is the Coordinate Structure Constraint, or CSC, first proposed in Ross (1967).

(9) Coordinate Structure Constraint (Ross 1967)

In a coordinate structure, no conjunct may be moved, nor may any element be moved out of that conjunct.

The CSC seems to hold fairly strongly in English, and interestingly, movement out of the internal conjunct seems to be universally impossible (Zhang 2010). However, there are a number of languages that seem to violate the CSC in some form. For example, Mandarin Chinese (Zhang 2010), Polish (Pražmowska 2013), Serbo-Croatian (Bošković 2009), and Old English (Ohori 2004), among others, have been argued to allow movement of the external conjunct out of the coordinate structure.

(10) Baoyu_i zuotian _i gen Daiyu zhuang de toupuxueliu (Mandarin Chinese)

Baoyu yesterday _i and Daiyu collide of bleed

‘Baoyu and Daiyu collided yesterday so that they both bled’

(11) Głośno_i Iza płakała _i i długo (Polish)

Loudly Iza cried _i and long

‘Iza cried loudly and long’

(12) ? Knige je Marko _i i filmove kopio (Serbo-Croatian)

Books is Marko and movies bought

‘Marko bought books and movies’

(13) Her Cynewulf_i benam Sigebryht his rices _i ond Westseaxna wiotan (Old English)

Here Cynewulf deprived Sigebryht his kingdom and West-Saxon elders

‘Here Cynewulf and the West Saxon elders deprived Sigebryht of his kingdom’

It should be acknowledged that much of the data in (10) through (13) can be questioned on a number of grounds regarding its legitimacy. For one, the data from Polish and Chinese is not totally clear; the Polish data may involve ellipsis, while it is not entirely clear that the Chinese data must be treated as an instance of coordination in the first place³. The Old English data, on the other hand, appears to be a clear instance of a violation of the CSC, but because the language is no longer spoken, it cannot be checked with native-speaking informants. This leaves us with the Serbo-Croatian data in (12), which is marked with a question mark, noting that it is grammatical but slightly unnatural. Ideally, to provide the strongest argument against the universality of the CSC, it would be best to have data from a language in which such CSC violations are not only fully grammatical, but which also has native speakers from whom to obtain grammaticality intuitions.

Interestingly, recent work done by Davis and Brown (2011) and Forbes (2013) seems to provide solid evidence of perfectly grammatical CSC violations in the Gitksan language of British Columbia, Canada. In this language, which, like English, requires interrogatives to be fronted in questions, it is possible to move an interrogative noun phrase that is coordinated with a non-interrogative noun phrase to the front of the sentence, stranding the coordinator and the other conjunct. An example of this is given in (14), from Davis and Brown (2011).

(14) Gwihl gubis Henry ganhl miyup? (Gitksan)

What eat Henry and rice

³ Zhang (2010) argues that the example in (10) is an instance of coordination, but other authors, as well as traditional Chinese grammar, have argued that ‘gen’ is merely a comitative preposition analogous to English ‘with.’ The data was included because it has been used as evidence against the CSC.

‘Henry ate what and rice?’ (Lit. ‘What did Henry eat and rice?’)

Gitksan also allows conjuncts to be separated from each other by a large number of words outside of the coordinate structure, much like the Old English example provided in (13) above. The sentence in (15), adapted from Forbes (2013), exhibits this property clearly.

(15) Neediin japhl anaax gans Colin

Not I make bread and Colin

‘Colin and I didn’t make bread’ (Lit. I didn’t make bread and Colin)

This evidence, along with the telling but less certain evidence noted above, suggests that the CSC, at least as it was formulated in Ross (1967), is not a universal syntactic constraint, and that its effects may be derived from other, more general factors⁴.

Given that the first three empirical observations described in this section appear to be universal, they will feature prominently in my examination of previous approaches to the syntax of coordinate structures in the next section, as well as in the analysis that I propose later in the thesis. The non-universality of the CSC will also figure prominently in my syntactic argumentation. I will also return to the differences in coordinate structure prosody between English and Japanese noted above in chapter three of this thesis due to their relevance with respect to the acquisition of Japanese prosody by native English speakers formally studying Japanese.

⁴ I will not propose what exactly these factors may be in this thesis, but instead will leave this to future work, whether carried out by myself or others.

3. Conclusion

In this chapter, I have given an overview of the overall structure of the thesis, including a summary of the content of each of its individual chapters. I then defined coordination and provided a description of the phenomenon's universal properties, as well as a cross-linguistically recurrent, but not universal, syntactic constraint known as the Coordinate Structure Constraint. The empirical observations described in this chapter will form the basis of a standard of adequacy by which previous approaches to the syntax of coordination will be reviewed and critiqued in the next chapter. They will also be the primary desiderata involved in the arguments for my own analysis of coordination.

CHAPTER TWO

The Syntax of Coordination

In this chapter, I introduce the analytical framework in which the syntactic structure of coordination is to be examined, the Minimalist Program dating from the proposal in Chomsky (1995). I then examine three major competing approaches to the syntax of coordinate structures, the flat structure analysis, the Spec-Head analysis, and the adjunction-based analysis of Munn (1993), and argue that none of them succeeds in providing a fully adequate theory of coordination. Finally, I propose that an adjunction-based account of coordination making use of decomposed Merge (Hornstein and Nunes 2008; Hornstein 2009; Larson 2010) is able to account for all of the major syntactic properties of coordinate structures.

1. Overview of the Analytical Framework: The Minimalist Program

The analyses presented in this chapter are all couched within the broad framework of the Minimalist Program (MP), proposed in its most widely accepted form in Chomsky (1995). In this framework, phrase structure rules familiar from earlier versions of generative grammar are eliminated and replaced by a single operation, termed Merge, which builds syntactic structure from the bottom-up, starting with simple lexical items and building more complex structures out of those items. This means that, instead of, say, starting with a rule that expands a sentence into a noun phrase and a verb phrase, Merge combines a noun phrase with a verb phrase to form a sentence. In most instantiations of the idea, Merge is constrained to apply only when the “uninterpretable” features of a

given lexical item need to be checked. These features are essentially the subcategorization features of a given lexical item. To illustrate this process, consider the simplified example derivation in (1) below, in which the verb “eat” has two uninterpretable determiner phrase (DP) features, which are subsequently checked off by merging the DPs “the cheese” and “I” with it¹.

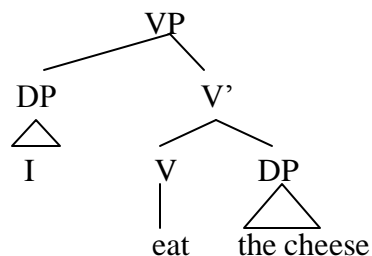
(1) eat [iF: VP; uF: DP; uF:DP] the cheese [iF:DP] I [iF: DP]

Merge (eat, the cheese)→eat the cheese [iF: VP; uF: DP] I[iF: DP]

Merge: (eat the cheese, I)→I eat the cheese [iF: VP]

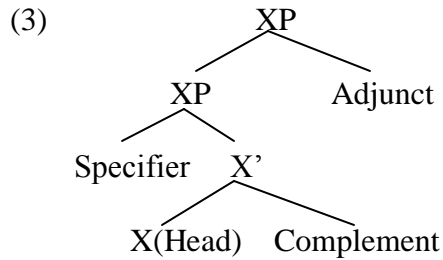
Here, Merge applies to eliminate the uninterpretable features of a lexical item, and when those features are eliminated, there is nothing left for Merge to operate upon, so the derivation ends. Although this is the technical apparatus underlying the process of structure building in the MP, most authors working in the framework simply describe the process informally and then provide a tree structure that acts as a model of the result of the successive application of Merge, which is the approach that I will take in this chapter. The technical description in (1), then, would be stated as in (2).

(2) The verb “eat” first merges with a DP complement, “the cheese,” and then merges with a DP specifier, “I,” to form a verb phrase.

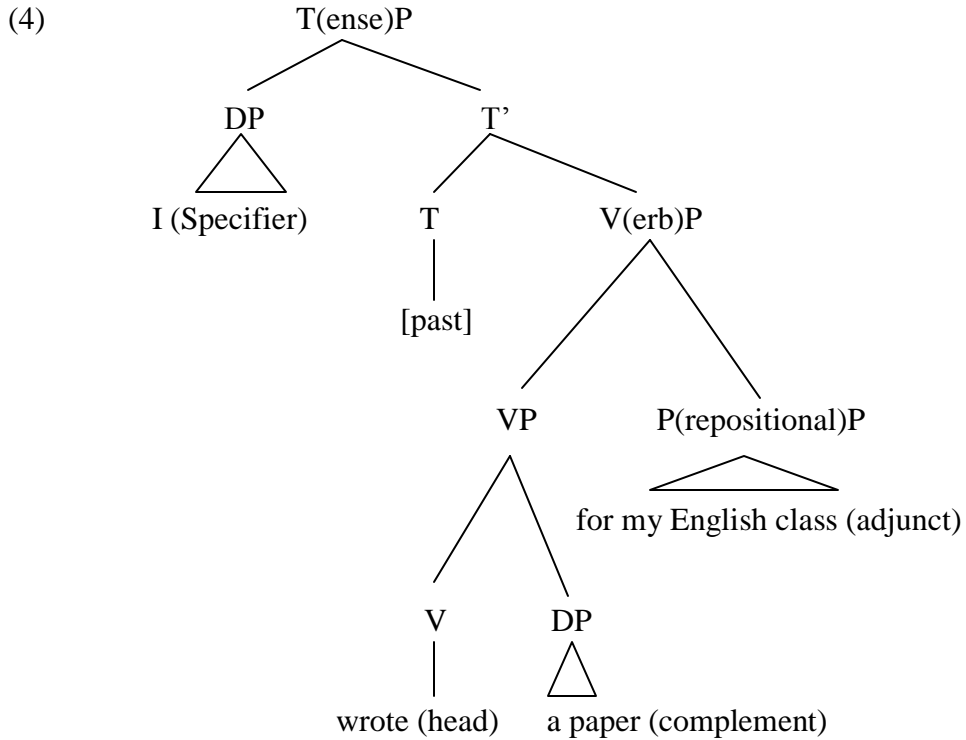


¹ This structure assumes what is called the VP internal subject hypothesis (Chomsky 1995), in which the subject of the sentence originates in the specifier position of the VP. This DP will subsequently move to the specifier of TP, once it merges with VP. This has been omitted for expository ease.

The terms “complement” and “specifier” are relational notions from X-bar theory, essentially corresponding to the two required arguments of the verb. They are much more general than this, however, as the argument of a preposition is termed the complement of the head preposition. The following schema describes the basic properties of phrases assumed in MP.



Basically, a specifier is any phrase that appears below a phrasal projection (XP) and next to an intermediate projection (X') in the tree. The “head” of a phrase is the element that gives the entire phrase its categorical identity, such that, for instance, the head of a verb phrase like “eat the cheese” is “eat.” The complement is any phrase that is required by the head and is located next to the head in the tree structure. The final relational notion, the “adjunct,” is an optional element that appears both next to and below an XP in the tree. The example in (4) makes use of all of these structural relations.



Here, the two phrases required by the verbal head “wrote,” “you” and “a paper,” are the head’s specifier and complement, respectively. The PP “for my English class,” on the other hand, is optional, and thus is considered an adjunct. Furthermore, in most versions of MP, complements and adjuncts may be reordered with respect to the head, so that while they appear after the head in English, they appear before the head in languages like Japanese². This basic difference between these two classes of languages is referred to as head-directionality, with English-type languages called “head-initial” and Japanese-type languages called “head-final.”

This brief overview will suffice for understanding the analyses critiqued in the next section. Further modifications to the theory, such as that undertaken in section three, will be explained when they are invoked.

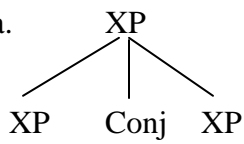
² Specifiers, on the other hand, are usually understood to linearize universally to the left of the head.

2. Previous Analyses

In this section, I will examine three of the major approaches taken to the syntax of coordination within the framework of Government and Binding theory/the Minimalist Program, namely the flat structure, Spec-Head structure and adjunction-based structure. Though all of these theories capture certain properties of coordination, I will show that none of them, at least as commonly formulated, is capable of describing all of the properties noted in the previous section.

2.1. The Flat Structure Analysis

The flat structure analysis of coordination is the oldest structure proposed in the generative literature, appearing as early as Chomsky (1957) in one form, and is still assumed today in some frameworks (Culicover and Jackendoff 1997) and occasionally even in the Minimalist Program (Toosarvandani 2012). On this view, all of the conjuncts in a coordinate structure are dominated by the same maximal projection, with the coordinator appearing between each conjunct, as in the schema and phrase structure rule below:

- (5) a. 
- b. XP: XP and XP

This rule is recursive, as it can easily apply to its own output, and thus predicts that coordination is unlimited. Further motivation for this structure comes from the semantics of coordination; semantically speaking, neither conjunct is superior to the other

in any way. It essentially treats coordination as a separate operation/rule of the grammar, not relating it to more general principles³.

This approach, however, immediately runs into problems, particularly if one assumes a strictly ternary branching structure like the schema and rule in (5). First, this structure fails to predict the difference between iterativity and embedding; in fact, the only way to capture the unlimited growth of coordinate structures in this approach is through embedding. For an illustration of this failure, consider the sentence in (6) (from Borsley (2005)):

(6) Hobbes and Rhodes and Barnes

While the flat structure can easily generate the grouped structure interpretations of the sentence, in which either Hobbes and Rhodes, or Rhodes and Barnes, form a group to the exclusion of either Barnes or Hobbes respectively, it cannot generate the sentence with the iterative interpretation, in which none of the conjuncts are grouped together.

Many authors have noted that the schema given in (5) is an oversimplification and have proposed extensions to account for the iterative nature of coordination. An example of this can be found in Jackendoff (1977), which offers the following rule for coordination.

(7) $\alpha \rightarrow \alpha_1 \dots \{\text{and/or}\} \alpha_n$, where α is any syntactic category.

(7) allows there to be a distinction between iterative and embedded coordination, but fails to account for the synonymy of coordinate structures with all of the coordinators present

³ This stems both from the fact that, in pre-X-bar syntax, the notions of specifier, complement, and adjunct were not yet fully developed, and from the traditional dichotomy between coordination and subordination.

and those in which all but one coordinator have been deleted. It also fails to note that such deletion is not possible in all languages, and as such fails to be a universal definition of coordination.

(8) Hobbes and Rhodes and Barnes = Hobbes, Rhodes, and Barnes

Moreover, even if the structure is extended to allow for the distinction between iterativity and embedding, it still fails to predict that the internal conjunct forms a unit with the coordinator to the exclusion of the external conjunct⁴. It thus follows that a theory based on this structure will fail to predict that linear order within a coordinate structure correlates with the overall head directionality of a particular language, and that this is further related to the fact that the internal conjunct and the coordinator form a unit.

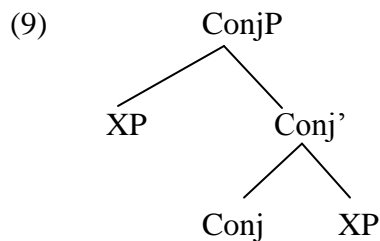
Finally, from a conceptual point of view, the flat structure is incompatible with many key assumptions within the Minimalist Program. Perhaps the most important of these is the binary nature of Merge, which takes only two elements and combines them into a set (Chomsky 1995). Structures like that in (5), with a single word projecting out of a maximal projection as a free element, projecting no phrase of its own, cannot be reconciled with this view of the language faculty without multiplying the number of entities that need to be postulated by the theory⁵. As such, an approach that does not require any additional operations or rules to account for the structure of coordination will always be conceptually preferable.

⁴ In fact, on such an analysis, there is no difference between external and internal conjuncts at all, so the terms become meaningless.

⁵ Despite this, Toosarvandani (2012) assumes a flat structure for coordination, though he adopts all of the other conventions of the Minimalist Program. No justification is provided for treating coordination thus, and it is possible that the author was merely using this structure as a neutral representation, remaining agnostic as to what the actual structure of coordination is.

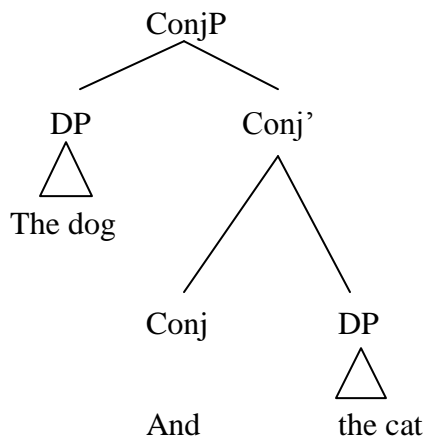
2.2. The Spec-Head Analysis

One approach to the structure of coordination is what Munn (1993) calls the Spec-Head analysis, proposed in Kayne (1994), Johannessen (1998), and Zhang (2010), among others. These analyses argue that coordinate structures form a maximal projection, typically called ConjP, in which the coordinator, which acts as the head of the entire structure, takes a maximal projection of any category as its complement (the internal conjunct) and another maximal projection as its specifier (the external conjunct). This can be represented by the following schema in (9).



A simple English coordinate structure could be described by this structure in the following way.

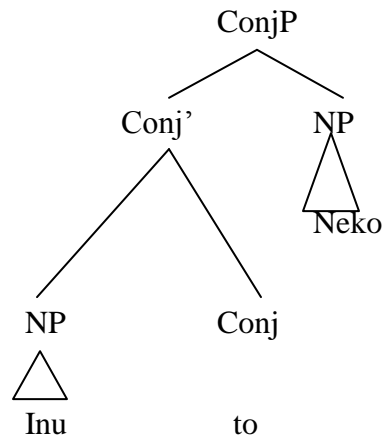
(10) The dog and the cat



Analyses of head-final languages like Japanese, particularly those of Johannessen (1998) and Zhang (2010), tend to treat the second conjunct as a rightward specifier, as in (11).

(11) Inu-to neko (Japanese)

Dog-and cat



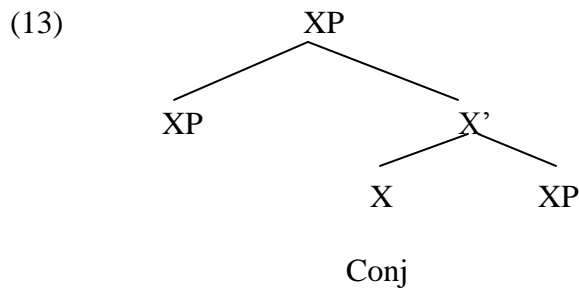
The Spec-Head analysis successfully captures the asymmetric nature of coordination; the Conj head and its complement (the internal conjunct) form an intermediate projection that excludes the external conjunct specifier. It is also consistent with X-bar theory, in that it makes use of exclusively binary branching, and all words in the structure project a phrase.

Though at first glance these approaches seem adequate for describing the syntax of coordination, they suffer from a host of problems. For example, at a very basic level, the Spec-Head structure for coordination is incompatible with the selectional properties of lexical items. In other words, the production of a ConjP is not given an explicit relationship to the rest of the generative system. In order to reconcile this structure with selection, the selectional properties of every lexical item would need to be augmented so

as to allow for the selection of a ConjP. This will not only complicate the grammar, but also results in a further problem, namely, since ConjP is not specified for category, there is no principled way to prevent a ConjP with, say, two VP conjuncts from merging where a DP would appear. As such, the system would overgenerate and produce something like the sentence in (12).

(12) *I bought go to the store and eat cheese.

In order to solve this problem, the ConjP would need to be specified for category, or somehow obtain the ability to take on the properties of its conjuncts. This is precisely the approach taken in Zhang (2010), in which the structure takes the form in (13), where the category of the Conj head is identical to that of its conjuncts.



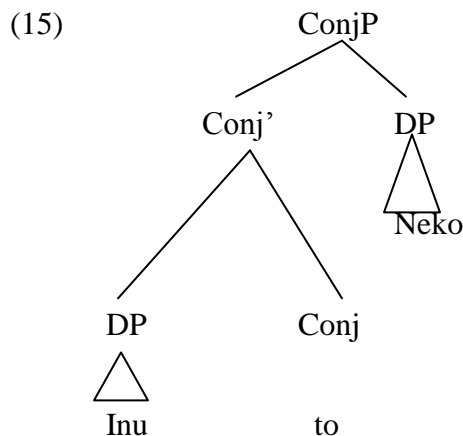
However, even with such a modification, the Spec-Head ConjP still fails to account for significant properties of coordination in a number of other key ways. Perhaps most significantly, such an analysis fails to distinguish between iterative and embedded coordination. In each of these approaches, ConjP only takes two conjuncts: one in the specifier position, and the other in the complement position. Though embedding is certainly possible with such a configuration, it is not possible to make a distinction between multiple applications of iterative coordination and embedded coordination, as the only way for coordination to apply indefinitely is to continuously embed coordinate

structures within other ones. Though Kayne (1994) does allow for the possibility of conjuncts being adjoined to the structure to derive iterative coordination with coordinator deletion, as in (14), such an analysis does not provide an explanation for the unbounded iterativity of coordination found in sentences like “John and Bill and Sam,”⁶ nor does it explain how the two structures mean the same thing.

(14) [John[X⁰[Bill[and Sam]]]]

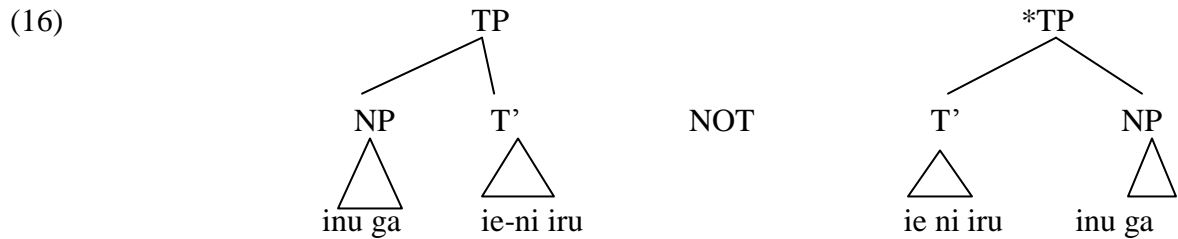
Such an approach also raises the question of why we should require two structural relationships, complementation and adjunction, in order to adequately describe coordination. A more parsimonious theory, in which only one configuration is necessary, is preferable to a theory that makes use of many configurations.

Finally, the treatment of the external conjunct in head-final languages under Spec-Head approaches is problematic. Recall the structure for a simple Japanese coordinate structure.



⁶ It should also be noted that iterative coordination without coordinator deletion, as in “John and Bill and Steve,” is far more common cross-linguistically, while rules of coordinator deletion vary from language to language. As such, it does not make much sense to neglect a more common structure in favor of one that is highly language-specific.

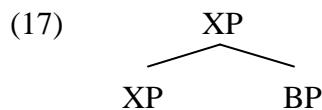
Though this structure succeeds in producing the correct word order, it places the specifier to the right of Conj'. In Japanese, specifiers linearize to the left, as in English, and as can be seen by examining a Japanese TP.



Placing the specifier of ConjP to the right in languages like this not only violates the word order principles of the languages in question, but in so doing results in a configuration specific to coordinate structures, undermining the proposal's ultimate goal of reducing construction-specific rules to more general principle.

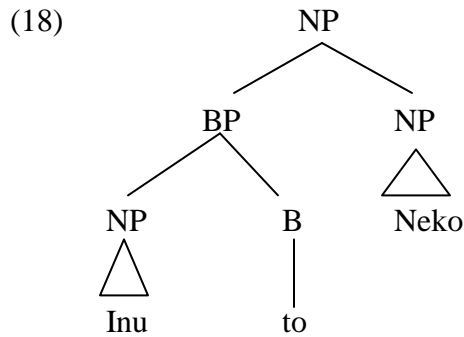
2.3. The Adjunction Approach

Though the Spec-Head approach to coordination fails in a number of significant ways, there is another syntactic analysis that handles the facts of coordination much more elegantly, namely the adjunction analysis, first proposed by Munn (1993). On this approach, a coordinator is a head that takes a maximal projection as its complement and projects a Boolean Phrase, or BP, equivalent in meaning to ConjP, which in turn adjoins to a maximal projection of the same category as the first, as in (17).



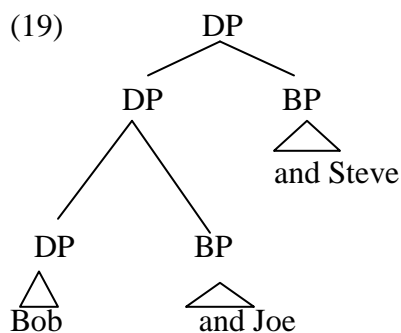
This approach successfully captures the universal asymmetric relationship between coordinators and conjuncts, as well as the intuition that coordination is optional

given that the BP is an adjunct. It also allows for an elegant analysis of head-final coordinate structures, such as those found in Japanese, with no need for rightwardly linearized specifiers.

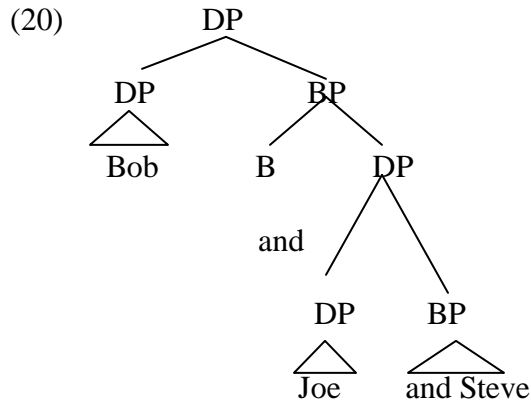


Furthermore, since the BP is not the head of the entire structure, the XP to which it is adjoined can be selected by other lexical items without any additional theoretical machinery. As such, this structure is not only compatible with the notion of selection, it is also more minimalistic in its formulation.

Perhaps this theory's greatest triumph over Spec-Head approaches is its ability to distinguish between most cases of iterative and embedded coordination in a natural way, though Munn (1993) does not explicitly discuss this. For instance, an instance of iterative coordination, in which no conjunct is grouped with another, such as "Bob and Joe and Steve," could be described by the structure in (19).



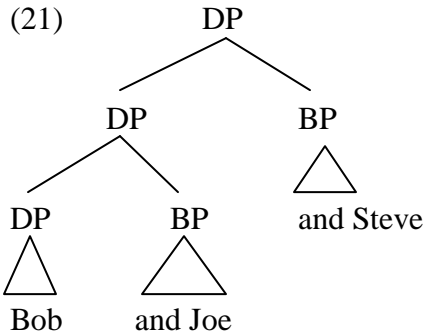
An instance of embedded coordination, as in “Bob, and Joe and Steve,” in which “Joe and Steve” form a unit to the exclusion of “Bob,” would then have the following structure.



Here, the grouping comes about by having the BP “and Steve” adjoin to the DP “Joe,” which merges with the head “and.” The whole structure then adjoins to “Bob.”

Though Munn’s analysis seems to capture all of the important aspects of the syntax of coordination, it suffers from one critical flaw. While the Munn’s adjunction analysis can easily generate iterative coordinate structures and non-initial embedded coordinate structures, it cannot unambiguously generate initial grouped structures⁷. In fact, it is completely impossible to unambiguously generate an initial group of arbitrary length using Munn’s structure, without making further adjustments to the system. As a case in point, consider the tree for a coordinate structure with an initial group, “Bob and Joe, and Steve.”

⁷ Here, “initial” and “non-initial” refer to orderings in English and other head-initial languages.



This tree is identical to the iterative coordinate structure in (19). In order to account for the difference, one could, for instance, add subscripts to the DPs, in order to show which BP is adjoined to which DP, but this seems to be an unnecessary complication that would be better done without.

Though Munn’s structure fails to account for an empirically significant aspect of coordination, it does account for the vast majority of the facts in an elegant, minimalistic fashion. Fortunately, it is possible to integrate Munn’s insights into a more adequate theory of coordination, namely through the use of Decomposed Merge.

3. Adjunction-based Coordination using Decomposed Merge

The theory of decomposed Merge, proposed in Hornstein and Nunes (2008) and Hornstein (2009), takes Merge to be a complex operation composed of two more primitive operations: Concatenate and Label. Concatenate, denoted with a caret ‘^’, simply combines two atomic objects without labeling them. The Label operation then labels the result of Concatenate, turning the two concatenates into an atomic object to which further concatenation may apply.

(22) a. X^Y

b. $[_X X^Y]$

Crucially, Concatenate does not generate hierarchical relationships between the objects being concatenated, so the result of concatenation is “flat,” in a sense. Hornstein and Nunes (2008) make use of the following notation, in which concatenates are written below each other to show that there is no hierarchical relationship between them.

(23) W^X

Y

Z

Hornstein (2009) argues that decomposing Merge like this allows one to capture the difference between complements and adjuncts. Particularly, complements must always be labeled with the head to which they are concatenated. Adjuncts, on the other hand, may be optionally labeled, because they are interpretable at LF without labeling. Using set-based notation, a VP with adjuncts would look like the following.

(24) $[_{VP} eat^[_{DP} the\ cake]]^[_{PP} in\ the\ yard]$

$^[_{PP} with\ a\ fork]$

$^[_{PP} in\ the\ afternoon]$

Here, while the complement “the cake” is both concatenated and labeled with the VP, the adjuncts are only concatenated to the VP, but are not labeled as part of it. In a sense, they “dangle” off of the VP. This approach thus captures the iterative, unstructured nature of adjunction.

Larson (2010), drawing on Munn (1993), notes that coordination has similar properties to that of adjunction and proposes that decomposing Merge into Concatenate

and Label allows one to capture a number of the properties of coordination. However, though Larson (2010) does point out the conceptual inadequacies of Munn's (1993) proposal, he does not point out the proposal's inability to unambiguously generate initial embedded coordinate structures. He also does not examine coordinate structures that make use of more than two conjuncts and, thus, does not explore the structural difference between iterative and embedded coordination in these contexts. However, it appears that Larson's proposal using decomposed Merge is precisely what is needed to provide an adequate theory of these phenomena.

3.1 The syntax of coordination using decomposed Merge

Following Munn (1993), I propose that coordination involves adjunction of a ConjP made up of a coordinator head and a complement of any category to another atomic object of the same category. Following Larson (2010), I will assume that the adjoined ConjP can be either left unlabeled following concatenation or labeled with the phrase to which it is concatenated. Here, I will show that, with the theoretical tools of Concatenate and Label, it is now possible not only to generate the same structures possible under Munn's (1993) approach, but also to generate initial embedded coordinate structures unambiguously.

First, recall three of the sentences from the first chapter, repeated below in (25), (26), and (27) for convenience.

(25) Bob and Joe and Steve

(26) Bob, and Joe and Steve fought each other

(27) Bob and Joe, and Steve fought each other

Here, (25) is an instance of iterative, unstructured coordination, while (26) and (27) make use of non-initial and initial embedded coordination respectively.

Using the set-based notation of Hornstein and Nunes (2008), we can model instances of iterative coordination like (25) straightforwardly by having the ConjPs concatenate to the first DP without being labeled as part of the DP. Since the two ConjPs have no structural relationship with one another, the ConjP “and Steve” is written below “and Joe.”

(28) Iterative coordination: “Bob, and Joe, and Steve”

$$[\text{DP} \text{Bob}]^{\wedge} [\text{ConjP} \text{and Joe}]$$
$$\quad \quad \quad \wedge [\text{ConjP} \text{and Steve}]$$

Non-initial embedded coordination can also be easily generated as in (29), with the ConjP “and Steve” concatenating to the DP “Joe,” and the ConjP containing them concatenating to the DP “Bob.”

(29) Non-initial group: “Bob, and Joe and Steve”

$$[\text{DP} \text{Bob}]^{\wedge} [\text{ConjP} \text{and} [\text{DP} \text{Joe}]^{\wedge} [\text{ConjP} \text{and Steve}]]$$

(28) and (29) are essentially notational variants of the tree structures that make use of Munn’s (1993) proposal. The real difference arises in the case of initial embedded coordination; while Munn (1993) provides no adequate way of generating initial groups that are structurally distinct from instances of iterative coordination, it is quite possible on an approach that makes use of decomposed Merge. Since labeling for an adjunct is optional, we can account for initial conjuncts by concatenating a ConjP to an XP, and

then labeling the structure. Then, any other ConjP can be concatenated to that labeled structure without being labeled as part of it itself.

(30) Initial group: “Bob and Joe, and Steve”

$[_{DP}[_{DP}Bob]^{[_{ConjP}and\ Joe]}]^{[_{ConjP}and\ Steve]}$

Here, the ConjP “and Joe” has been concatenated to the DP “Bob.” The result of that concatenation is then labeled, resulting in the atomic object “Bob and Joe.” The ConjP “and Steve” is then concatenated to “Bob and Joe,” but crucially is not labeled, and thus remains outside of the structure. This structure also allows initial embedded coordinate structures to be unbounded in length, as any ConjP concatenated to a labeled structure could be labeled with the structure, thus rendering the entire structure atomic and allowing it to be subject to further concatenation. As such, (31) is just as easily generable as (30), where “Bob and Joe and Steve” are labeled as a single unit to the exclusion of “and Mary.”⁸

(31) $[_{DP}[_{DP}[_{DP}Bob]^{[_{ConjP}and\ Joe]}]^{[_{ConjP}and\ Steve]}]^{[_{ConjP}and\ Mary]}$

This approach predicts that the external conjunct should be able to move without the ConjPs that are concatenated to it, but not labeled. Though this is not possible in English, it does seem to be possible in a number of other languages, such as Gitksan and Old English as noted in chapter one. It also makes the prediction that initial groups, having been labeled and thus converted into an atomic object, should be able to move just as easily. Thus far, I have no data that either confirm or disconfirm this. Future research that explores differences in the extractability of the external conjunct in different

⁸ In this way, the structure parallels the optional labeling of VP adjuncts explored in Hornstein and Nunes (2008) and Hornstein (2009).

languages and the ease of extracting initial groups in languages that do allow such extraction would prove fruitful in this regard.

4. Conclusion

In this chapter, I have described certain properties of coordination that any syntactic theory should be able to explain. I have examined the flat structure, Spec-Head, and adjunction-based proposals for the syntactic structure of coordination within the framework of the Minimalist Program, and shown that, while Munn's (1993) analysis is more adequate than the other analyses, none of the proposals adequately characterizes all of the major properties of coordination. Finally, I have proposed that an adjunction-based theory of coordination that makes use of decomposed Merge is able to account for all of the major properties of coordinate structures. Though future research is needed to examine the full consequences of the theory, as well as to find an explanation for why the Coordinate Structure Constraint should hold firmly in some languages but less so in others, this proposal at the very least offers an explanation for properties of coordination that thus far appear to be universal.

CHAPTER THREE

Study of the use of prosody in Japanese coordinate structures by native English-speakers

In this chapter, I present the findings of an empirical study that investigated the prosody of native English speakers learning Japanese when pronouncing coordinate structures in Japanese. After providing a brief introduction to the phenomenon under investigation, including a description of the basic prosodic difference between Japanese and English, the questions to be addressed in the study, and the initial hypothesis, I detail the methodology of the study, including the number and type of participants used, and how the data was collected. Finally, I present the results of the study at the end of the chapter.

1. Introduction and Motivation

As stated previously, Ross (1967) noted that English speakers can insert a pause in speech between the first part of a coordinate structure and the coordinator, but not between the coordinator and the second, as in (1) below.

(1) The dog ||and cat¹

The situation is the exact opposite in Japanese. In the Japanese equivalent of English “the dog and cat,” “neko to inu,” Japanese speakers can naturally insert a pause between the second part of a coordinate structure and the coordinator, but not between the first and the coordinator.

¹ The notation used here is due to Wagner (2007). ‘||’ marks an intonational boundary.

(2) Inu to||neko

While there is a significant amount of work dealing with prosody in coordination in general, as well as in particular languages like English (Wagner 2007) and Japanese (Kawahara and Takahito 2008), very little work has been done on how second language learners acquire and use these prosodic structures for coordination in the language they are learning.

The purpose of the present study, then, is to work to fill this gap, specifically by investigating the use of prosody in Japanese coordinate structures by native English speakers who are learning Japanese. The questions to be addressed are the following:

- 1) Do second language learners of Japanese make use of English prosody or Japanese prosody when using coordinate structures in speech in their second language?
- 2) Is there a relationship between amount of classroom experience learning the language and type of prosodic structure used (English type prosody vs Japanese type prosody).

The initial hypothesis is that there is a relationship between the amount of classroom experience learning the language and the type of prosody used. Specifically, it is expected that the beginning learners (1000 level in the study to be described) should display little to no use of Japanese-style prosody, about half of intermediate learners should have English prosody, with the other half having Japanese prosody, and most, if not all, of the advanced students should have Japanese prosody.

This study will prove informative for many areas of research, including, but not limited to, syntactic theory, second language acquisition, and language pedagogy. With

regards to syntactic theory, the results of the study will constitute part of the argument made in the previous chapter of this thesis in favor of the adjunction approach to coordination, based on a modification of the proposal in Munn (1993). In second language acquisition, this investigation will prove useful for the study of transfer, defined in Kellerman and Sharwood (1986) as “the interplay between earlier and later acquired languages.” To be more precise, this study will investigate transfer with regards to the degree to which second language learners transfer aspects of their native language over to the language they are learning, and when or if they stop doing this at a later stage of learning. It will also act as a contribution to the study of the learning of second language prosody in general. Finally, the study will be beneficial for language pedagogy by revealing the degree to which classroom experience with a language correlates with the degree to which one uses either their native prosody or the target language’s prosody, and, as such, whether the target language’s prosody can be learned through indirect experience or must be explicitly taught.

2. Methodology

For its participant sample, this research made use of 35 students currently enrolled in Japanese classes at Baylor University. All subjects were older than 18 years and had signed an Informed Consent Form agreeing to participate in this study. The participants were all given a short language background questionnaire which asked them to list their native language, current class level in Japanese (1000, 2000, or 3000), whether they had any formal experience studying Japanese before enrolling in courses at the university level, and whether they had ever studied abroad in Japan, either during or before college, and, if so, for how long. All of the students who participated in this study listed English

as their native language, with only one student describing himself/herself as a native English-Spanish bilingual².

The participants were organized into three groups, termed 1000, 2000, and 3000. The 1000 group, which was composed of beginning-level students who had studied Japanese for at least one semester, contained 13 students, none of which had any experience studying Japanese prior to enrolling in a Japanese class at Baylor. The 2000 level group, made up of intermediate level students of the language who have studied it for at least 3 semesters, contained 12 students. Of these twelve, two of these students had studied Japanese at the high school level before taking classes at Baylor, while all of the others had only had formal classroom experience at Baylor. Finally, the 3000 level group, which is comprised of students with an advanced grasp of the language who have studied it for at least 5 semesters, contained 10 students. Out of the three groups, this one was the most diverse; 4 of the students had studied abroad in Japan during college. Two of these students studied abroad for a semester, while the other two had studied abroad for an entire year. Furthermore, two of the students indicated that they had studied Japanese formally during high school. The following table provides a summary of the participants detailed above.

² Given the close relationship between English and Spanish, as well as their similar use of prosody in coordinate structures, it is unlikely that native-level knowledge of both of these languages could have skewed the participant's performance in the experimental task.

Class level	1000	2000	3000
# of participants	13	12	10
# with Japanese language experience prior to college	0	2	4
# studied abroad in Japan	0	0	4

Figure 1 Information about participants in study

The students were then given a set of 10 Japanese language sentences to read, all of which are listed in (3) below.

(3) List of Japanese language sentences that participants read

- i. 日本語を勉強したいですが、どうしてわかりません。
- ii. ヨーロッパに行ったことがありませんが、大学を卒業したら、パリやローマに行くつもりです。
- iii. この家には、小さい猫と大きい犬がいます。
- iv. 平安時代には、京都は日本の都であった。
- v. 私は魚があまり好きじゃないから、鮭や鯛をぜんぜん食べない。
- vi. 日本三景は天橋立と松島と巖島です。
- vii. 私はこの時初めて、言いようのない疲労と倦怠とを、そうしてまた不可解な、下等な、退屈な人生をわずかに忘れることができたのである。
- viii. どうしてバイオリンを弾くようになったのですか。
- ix. トルコのイスタンブールは東西の交通と交易の中心で、文明の交差点と呼ばれていました。
- x. 英語かフランス語かどっちか話せる。

The sentences in (4) provide a rough translation of each of the 10 sentences above, for the convenience of those who do not read Japanese.

(4) Translation of sentences in (3)

- i. I want to study Japanese, but I don't know why.
- ii. I've never been to Europe before, but when I graduate, I plan on going to Paris and Rome.
- iii. In this house, there is a small cat and a big dog.
- iv. In the Heian Period, Kyoto was the capital of Japan.
- v. Because I don't like fish very much, I never eat things like salmon and grouper.
- vi. Japan's Three Scenic Views are Amanohashidate, Matsushima, and Itsushima.
- vii. It was not until then that I could forget for a while the inexplicable fatigue and weariness and the obscurity, lowness, and boredom of life.
- viii. How did you come to play the violin?
- ix. Istanbul, Turkey, is the center of trade and transportation between the East and West, and is called the intersection of civilizations.
- x. He can speak either English or French.

Seven of the sentences above contain nominal coordinate structures, while three of the sentences, namely sentences (i), (iv), and (viii) are distracter sentences that do not contain any nominal coordinate structures at all. Although some of the sentences (i, ii, and ix) contain clausal coordinate structures, because these are overtly marked with a comma which serves as a cue to pause, they cannot be used to examine the natural prosody of English-speaking students when reading in Japanese. Because nominal coordinate structures are usually not marked by commas, and none of them are marked in the sentences above, these served as the primary reference points when the data was observed.

It should be noted that all of the students who participated in this study were proficient readers of the two phonetic syllabaries used in Japanese writing, hiragana and

katakana, thus ensuring that all could read the sentences in the first place. However, not all of the participants were equally proficient in reading Chinese characters, called kanji, which are also used when writing in Japanese. Therefore, all kanji characters were augmented with furigana, hiragana letters written above kanji that explicitly describe how the character is to be pronounced in that context, thus eliminating any problems related to reading the sentences.

Upon arriving at the Language Acquisition Center, each student was assigned a random number, with which they were instructed to label their file upon completion of the task. These random numbers ensured the total anonymity of all of the participants in the study, but do not appear in the data provided below, as they were merely used for data storage purposes, in order to distinguish each file from the same class level from the others.

Participants were then instructed to record themselves reading each sentence as naturally and fluently as possible. While the participants were informed that the purpose of the study was to investigate the Japanese prosody of English speakers learning Japanese as a second language, they were not told that the focus of the study would specifically be on prosody in coordinate structures, so they should not have focused on those sentences that made use of coordinate structures any more than those without them. Using the Audacity recording program available in the Language Acquisition Center, each student recorded himself or herself reading each one of the sentences in (3) aloud. The recordings were saved to a flash drive, each one identifiable only by their class level (1000, 2000, or 3000) and the number assigned to them at the beginning of the recording session.

Once every student from each group had been recorded, the files were examined by the investigator and a native Japanese-speaking assistant, who will not be identified in this study, to see which participants used English-style prosody when pronouncing coordinate structures in Japanese by inserting a pause between the coordinator and the conjunct that preceded it, and which ones used Japanese-style prosody by inserting a pause between the coordinator and the conjunct following it. The use of a native speaker assistant makes the claims about the type of prosody particular students used more credible, as the native speaker has an intuitive understanding of Japanese prosody that the non-native Japanese-speaking investigator lacks. It is hoped, then, that this will improve the validity and reliability of this study.

3. Results

Upon finishing the investigation of all 35 files, a number of interesting properties were observed in the data. First of all, none of the participants exhibited both kinds of prosody in their pronunciation of Japanese coordinate structures. That is, a particular participant either exhibited English-style prosody or Japanese-style prosody all the way through, never both in different contexts. As such, there was no need to point out each coordinate structure separately in the results, as performance on the sentences was uniform with respect to particular subjects. It was further noted that participants' prosodic pauses were always very clear, and as such all prosodic boundaries were clearly marked in the data, thus allowing for easy examination.

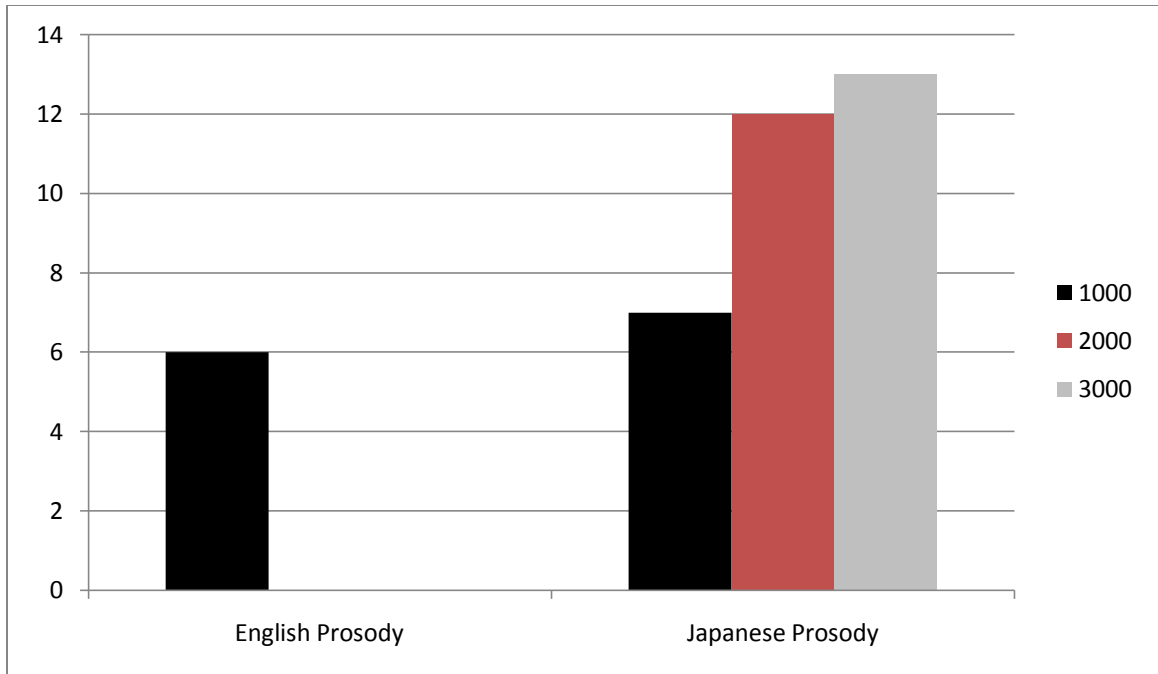


Figure 2 Use of either Japanese or English-style prosody in coordinate structures by participants

As one can see in Figure 2 above, six out of 13 of the 1000-level group of Japanese students made use of exclusively English-style prosody when pronouncing the coordinate structures in the Japanese sentences, while the other seven made use of exclusively Japanese style prosody. On the other hand, both the 2000-level group and the 3000-level group exclusively used Japanese-style prosody when pronouncing the coordinate structures. There was 100% agreement between the investigator and the native Japanese-speaking assistant on the prosody assigned to each participant. Given that none of the 1000-level students who participated in this study had studied abroad or studied Japanese prior to attending Baylor, only two of the 2000-level students had studied Japanese at all before attending Baylor, and only four of the ten 3000-level students had studied abroad, and only three of them had studied Japanese before taking formal classes in it at the university level, it does not seem possible to establish a relationship between the type of

prosody used and either the fact that a participant studied abroad or the fact that they studied the language formally before attending Baylor.

The results are also surprising from the perspective of the initial hypothesis. While they are generally in line with the prediction that students with more formal experience studying Japanese were more likely to make use of Japanese-style prosody when reading Japanese coordinate structures, the learners had begun to acquire the prosodic structures under investigation sooner than expected, with the 1000-level group displaying the properties expected for the 2000-level group, and the 2000-level group displaying the full use of Japanese prosody expected for the 3000-level group. The 3000-level group performed as expected.

4. Conclusion

This study investigated the prosody of native English-speaking students studying Japanese at Baylor University when pronouncing Japanese-language coordinate structures, which were read from a list of ten sentences. The results of the study showed that seven out of the thirteen 1000-level students exhibited Japanese-style prosody by producing an audible pause between the coordinator and the conjunct following it, while the other six produced an audible pause between the coordinator and the preceding conjunct, the English-style prosodic grouping. Both the 2000-level and 3000-level groups exclusively used Japanese-style prosody. Although this is consistent with the expectation that learners who have more experience studying Japanese formally are more likely to make use of Japanese-style prosody than those with less formal experience, the distribution of those who made use of English prosody vs. those who used Japanese

prosody was unexpected, with the 1000-level group displaying the anticipated properties of the 2000-level group.

In the final chapter, I will synthesize the theoretical arguments made for an asymmetric adjunction structure for coordination and the experimental findings made in this chapter, and argue that both of them have implications for one another.

CHAPTER FOUR

Concluding Remarks

In this thesis, I have investigated the phenomenon of coordination from two distinct, but related, perspectives, one from the perspective of formal syntactic theory, and the other from second language acquisition. From the perspective of syntactic theory, I investigated a number of current approaches to the universal structure of coordination, and found every one of them to be both conceptually flawed and lacking in adequate empirical coverage. To remedy this, I proposed a new analysis that extends Munn's (1993) adjunction-based analysis by augmenting it with the decomposed Merge operation of Hornstein (2009), and showed that such a structure not only accounts for the universal properties of coordinate structures, but also predicts the existence of languages like Gitksan and Old English, which do not obey the Coordinate Structure Constraint. From the perspective of second language acquisition, I have conducted an experiment that investigated the use of coordinate structure prosody among native English-speaking students studying Japanese at the university level, and found that, contrary to what is predicted by widely used models of the syntax of coordination, students begin to acquire the Japanese-type prosody in coordinate structures very early, and in fact learn the distinction earlier than initially hypothesized.

In what follows, I would like to explain the relationship between the abstract syntactic analysis of chapter two and the results of the empirical study of chapter three. I intend to show that these two distinct areas of research have important implications for

one another, particularly in that the second language acquisition study shows that students are capable of learning a distinction that most current syntactic models do not predict to exist in the first place, thus providing an experimental basis for deciding between rival theories. Finally, I will discuss the limitations of the research and proposals put forth in this thesis, and suggest avenues for future research to fill in the gaps that remain.

1. Implications of the syntactic analysis and SLA study

The results of the second language acquisition study summarized in chapter three have immediate implications for the proper syntactic analysis of coordination. Two of the models of the syntax of coordination that were discussed in chapter two, the flat structure analysis and the strong version of the Spec-Head analysis advocated by Kayne (1994), do not allow for a distinction to be made between English-type and Japanese-type coordinate structures, because they treat their proposed structure, as well as their ordering, as universal. As such, according to a theory incorporating such an analysis, there should be no such binary distinction to be learned in the first place, whether as a first or second language. Although it is enough to show that such a distinction exists among native speakers of different languages to falsify these theories, the fact that the distinction between the two kinds of structures is capable of being rapidly learned by second language learners reveals that the distinction is learnable well beyond the so-called Critical Period of language acquisition (Lenneberg 1967), which further serves to discredit the aforementioned theories.

The experimental study also has clear implications for the area of second language acquisition, as well as foreign language pedagogy. First of all, given that the difference in coordinate structure prosody between English and Japanese was not directly taught by the professors, the study offers strong evidence for the fact that second language learners do not need to be explicitly taught every aspect of the structure of the language they are learning in order to acquire it effectively. It also provides evidence that, while learners do seem to transfer aspects of the prosody of their native language to the second language, they do not do so for long, and by their second year of study they seem to have completely stopped transferring the English-type prosody onto Japanese coordinate structures.

2. Limitations and areas for future research

It is only natural that such a small-scale study should be limited in certain respects. For one, although I have proposed a new syntactic analysis that aligns very well with the observed universal phenomena associated with coordination, there remain a number of very perplexing cases related to coordination for which the proposal provides no obvious explanation. For instance, this thesis does not provide an analysis of right-node raising or gapping, two very problematic and poorly understood topics within syntactic theory for which no generally accepted analysis is yet available. It would be fruitful to investigate whether the general picture of coordination discussed in this thesis has any implications for the analysis of such peculiar constructions. Further research is also needed to test the full implications of the analysis for the Coordinate Structure Constraint, particularly with respect to the extent to which it is cross-linguistically violable and, in languages in which it appears to be violable, whether it is possible to extract conjuncts containing arbitrarily

large coordinate structures, or if there is a size limit on the acceptability of such extractions.

The syntactic analysis also makes one typological prediction that does not seem to be borne out, namely that there should be languages that place the coordinator before the first conjunct, with nothing occurring before the second conjunct. Haspelmath (2000) explicitly notes that this ordering is absent in the typological record, and provides a number of reasons for why this may be the case. For instance, he hypothesizes that perhaps the absence is due to the unavailability of an environment in which an element positioned before the first conjunct could become analyzed as a coordinator. It is also not infeasible that such an ordering could prove difficult to process, perhaps because one would have to predict where the gap in the coordinate structure in which no coordinator occurs would be, which could prove hard to predict as more conjuncts are added to the structure. Regardless of the reason, just because a predicted possible ordering does not occur does not in principle make it impossible to learn, so there is no a priori reason to make an explicit attempt to eliminate such structures from Universal Grammar. Research involving artificial language learning may help to show whether or not such structures are learnable by humans.

The second language acquisition study discussed in chapter three is also limited in many respects. Perhaps the most important limitation is its small sample size; with only 35 participants, and only around 10 in each category, it is difficult to say whether the generalizations noted by the study hold with a significantly larger number of participants. As such, it is important to attempt to replicate the experiment with a much larger sample size to see if a similar distribution to the one noted in this thesis emerges in the data.

Another important limitation is the amount of exposure the participants had to Japanese. Although I was careful in making sure that most of the participants had had very little formal Japanese education prior to starting college, when the study was conducted, all of the participants had taken at least one semester of Japanese at the university level. As such, there were no true beginners in the participant sample, and therefore the study did not examine participants in the very first stages of acquiring the distinction between English and Japanese with respect to coordinate structure prosody. If this had been done, perhaps the results would have patterned along the lines of my initial hypothesis. Conducting the study with less experienced participants would thus further elucidate the issue of when second language learners of Japanese begin to acquire Japanese-type prosody.

Another complicating factor that bears on the results of the experimental study is the pedagogical methodology practiced by the Japanese instructors at Baylor University. While the professors affirmed that they do not explicitly teach the difference between English and Japanese coordinate structure prosody, they do focus heavily on enhancing the oral fluency of their students, so students in their classes begin hearing and producing Japanese very early on in their education. As such, it is not inconceivable that students of Japanese at Baylor begin to acquire the relevant structures at an earlier time and at an accelerated rate compared to students at other universities. It would therefore be informative to investigate how students of Japanese at universities with less of a focus on oral proficiency fair compared to the students at Baylor, though admittedly this may be difficult to test.

All in all, this thesis has provided answers to a number of problems plaguing the syntactic analysis and second language acquisition of coordination and has also raised a number of important questions. It is hoped that the analyses and work displayed in this thesis can serve as the basis for solutions to these questions in future research.

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