

A PREFERENCE ANALYSIS OF IMPERATIVES
CONNECTING SYNTAX, SEMANTICS, AND PRAGMATICS

A Dissertation

Presented to the Faculty of the Graduate School

of Cornell University

in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

by

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August 2013

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Cornell University 2013

This dissertation advocates for a *preference analysis* of imperative constructions. The analysis is founded on preference semantics (Starr 2010; 2012), a dynamic semantic system that represents declarative, interrogative, and imperative content in a single *preference state*. This new framework has several explanatory advantages over the prior *modal analysis* (Schwager 2006; Kaufmann 2011) and *property analysis* (Portner 2004a; 2007).

Under the proposed analysis, imperatives contribute both propositional content (the commanded action) and illocutionary content (the imposition of an obligation). This split in meaning explains the inability to use a follow-up utterance to challenge an imperative imposition of an obligation, since challenges can only target propositional content. On the other hand, the propositional content of an imperative can be used to compare it to the Question Under Discussion (the formalized representation of the discourse topic) to determine whether the imperative is Relevant. I propose a new method of computing Relevance for any utterance type that uses the difference between pre- and post-utterance discourse states and the QUD.

I examine imperative syntax from the perspective that illocutionary content must be borne by a syntactic element in the clausal left periphery. I show that this syntactic element does not drive movement in all languages, contra previous explanations of clause typing (Han 2000; Koopman 2007). I also present new data on the relative acceptability of contrastive and non-contrastive topic fronting in English imperatives. I explain this distinction by showing that clause-typing [Force] and topicalization [Top] features are encoded on a single syntactic head in English, while focalization [Focus] is independent. The proposed structure allows the position of *do*-support in English negative imperatives to be ascertained for the first time: it is Focus⁰. Additionally, the structure of matrix and embedded imperative clauses is shown to be

identical, predicting several facts about extraction from embedded imperatives.

Finally, I show that the preference analysis is compositional by mapping both illocutionary and propositional content onto the clausal structure. The result is that all well-formed clauses represent update functions from preference states to preference states. Since this also applies to embedded clauses, embedding verbs of communication must be able to accept update-denoting constituents as one of their arguments. I conclude that the preference analysis is superior for analyzing imperative syntax, semantics, and pragmatics, as no other analysis can account for all of the discussed phenomena in a unified way.

BIOGRAPHICAL SKETCH

Edward Sgro Cormany was raised in Shaker Heights, Ohio.

He attended the University of Michigan from 2003–07 as a Sidney J. and Irene Shipman Scholar. He received a Bachelor of Arts with a dual concentration in Linguistics and Classical Languages & Literatures from Michigan in 2007. He was awarded Highest Honors for his thesis on “Syntactic Models for Coordination in English and Latin”, written under the direction of Acrisio Pires and Sam Epstein.

He enrolled in the Ph.D. program in Linguistics at Cornell University in 2007. He was awarded an Academic Year Foreign Language and Area Studies Fellowship to study Italian in 2009. He served as an instructor in the John S. Knight Institute for Writing in the Disciplines for five semesters from 2008–13.

He received fellowships to attend the 2009 Linguistic Society of America Summer Institute at the University of California, Berkeley and the 2012 North American Summer School of Logic, Language, and Information at the University of Texas, Austin. He attended the 2013 LSA Institute at the University of Michigan, returning to his *alma mater*. After the conclusion of the Institute, he remained in Ann Arbor, where he now resides.

In memory of Albert J. Sgro
who always encouraged me to do better

ACKNOWLEDGEMENTS

It is impossible for me to say exactly where or when this dissertation began. At some point in an advising meeting, my co-chair Sarah Murray told me that I should just go ahead and make a folder on my computer named “dissertation” and put a blank Cornell thesis template in it...the rest would follow. It is certainly possible to trace backwards in time to earlier milestones: my first advanced semantics seminar, enrolling at Cornell, adding a second major in Linguistics at Michigan, deciding to study Latin in 7th grade, or learning to touch type on an Apple Extended Keyboard II in 1993 — a keyboard which I dug out of my parents’ basement and used to write much of this dissertation. Regardless of where it begins or ends, this has not been a solitary endeavor.

First, I would like to thank those who were most directly involved in this research, my advising committee consisting of John Whitman, Sarah Murray, John Bowers, and Michael Weiss. They have provided insightful feedback and honest support in all of my academic efforts.

Many thanks to John Whitman for seeing this project through to its completion. He has guided my research in many ways, starting by getting me involved with diachronic syntax at the DiGS conference hosted at Cornell in 2008. As my interests shifted to semantics and then to pragmatics, his level of commitment to my work did not waver. I have never figured out how he squeezes so much time out of a single day, but I am glad that he has dedicated some of it to me.

I probably wouldn’t have given semantics a second chance if I hadn’t seen the enthusiasm that Sarah Murray brings to her research and teaching. My first seminar with her was on evidentials, a topic which is dear to her but took the class the better part of the semester to grok. Even though my work barely touched on the subject, she took immediate interest in it and guided me through the semantic literature on imperatives. The term paper that I wrote for that class — revised a thousand times over — is at the core of this dissertation. Through her mentorship she has shown me what it means to deeply care about not just linguistics, but linguists. I have been able to rely on her for everything from checking every symbol and bracket of a semantic proof to moral support on an ugly winter day in Ithaca, and for that I am extremely grateful.

John Bowers has been a champion of my syntactic work throughout my time at Cornell. He was instrumental in my continued work on imperative syntax, starting with a Syntax II term paper (which I'm now embarrassed to even look at), squibs in Research Workshop, A-papers, and now this dissertation. Every meeting with him gave me new ideas, new data, and a reminder that I was not working alone.

Michael Weiss has kindly stayed on as an advisor throughout my entire Ph.D. candidacy. His protestations that he doesn't know much about syntax are made out of modesty, not ignorance, and he has always found ways to help me improve my research. His "outsider's" perspective has helped me clarify my thoughts and writing and present my work to a larger audience.

The one person who had the greatest effect on the content of this dissertation without assuming an official role is undoubtedly Will Starr. He offered me his research on preference semantics wholesale and has let me take his ideas and run with them. He has been extremely generous in sharing his time, work, advice, fancy beer, and whiskey.

Special thanks also to Craige Roberts, who has given valuable feedback on this project at several steps along the way. When we first met at SWAMP in 2011, she immediately welcomed me into the fold of people conducting research on formal pragmatics. Our paths have only crossed occasionally since, but at every meeting she offered insight into her research on Relevance and gave me advice and encouragement on where to direct my efforts.

Cornell Linguistics has not just given me a degree, but many friendships that will last long after I leave Ithaca. My syntactic partners in crime Sarah Courtney, Cara DiGirolamo, and Neil Ashton have taught me the joy of going to the bar for happy hour under the pretense of "reading group" and having an actual argument over a Linguistic Inquiry monograph. Julie Balazs and Kyle Grove have also been amazing friends, sounding boards, storytellers, and proof that there is life after linguistics.

I wouldn't be able to approach linguistics in the same way if it weren't for the daily antics and support of the worldwide twitter linguists. There is no faster way to find a PDF of an article and no better venue for terrible, nerdy linguistics jokes. #wuglife

This dissertation wouldn't be possible without the unconditional support of my family. My parents, Carl Cormany and Valentina Sgro, continue to show so much love and pride in what I do, even though

I am long past the point of being able to explain it to them. Whenever I felt like I ought to quit, they always reminded me what I set out to do when I came to Cornell. I am so happy that they convinced me to persevere.

Finally, thanks to Jen Fischell for being my source of sanity. Library parties, thesis man (=D)€-< and hugs fueled this dissertation.

There are certainly many others who I have forgotten to mention. To everyone who has put me on the path towards my love of language, writing, and linguistics: thank you. Without you all, I would be in another place.

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CHAPTER 1

INTRODUCTION

It can no longer be said that imperative constructions are understudied, but even as they have gained attention in the linguistics literature, they have frequently remained the odd man out. Ever since the transition from early transformational grammar to more restricted models, declarative and interrogative sentences have been explained as equals, with both types of sentence produced and interpreted by the same grammatical mechanisms. In contrast, much of the recent literature on imperatives has been imperative-specific, only accurately explaining them by postulating additional sub-grammars. The overall goal of this dissertation is to close the gap between imperatives and other sentence types within three areas — syntax, semantics, and pragmatics — without unifying one area at the expense of fragmenting another.

Several areas of linguistic theory lack a standard account of imperatives. The syntax of declaratives, polar questions, and *Wh*-questions has been exhaustively studied, and there are widely accepted mechanisms in minimalist syntax that explain their commonalities and differences. For example, the differences between declaratives and interrogatives, or between languages that form questions with *Wh*-movement or *Wh-in-situ* constructions are all explained in terms of the same primitives: the syntactic features of functional heads, Merge, and Agree. Many accounts of imperative word order do not use these tools in a way that highlights the similarities between clause types, instead positing imperative-specific structure, such as the JussiveP of Zanuttini et al. (2012). Yet these same accounts do not propose DeclarativeP or InterrogativeP projections (with the exception of Rizzi (2004) and cartographic work building upon it). Likewise in semantics, there are standard representations for declaratives (sets of worlds) and interrogatives (sets of sets of worlds), but no consensus representation for imperatives. Portner (2004a; 2007) proposes that imperatives be treated as properties (functions from individuals to sets of worlds), but this requires that imperatives in discourse are tracked with several pragmatic operations, whereas declaratives and interrogatives require just one pragmatic operation each. In theories of discourse relevance (e.g. Roberts 1996; 2004; Simons et al. 2011), straightforward criteria are given for when declarative and interrogative utterances make fruitful contributions to a conversation, but imperatives are either not addressed or given vague

requirements.

Another aspect of recent studies of imperatives is that they tend to only address a single aspect of imperative constructions. The most comprehensive recent work on imperatives, Aikhenvald (2010), is largely a typological study and does not deal with formal theory. Syntactic accounts of imperatives focus on the location of an imperative operator within an imperative clause's structural hierarchy (e.g. Han 2000; Mauck and Zanuttini 2005; Koopman 2007; Zanuttini 2008), but do not define that operator's meaning. Conversely, Kaufmann (2011), building on her previous work in Schwager (2006), defines an imperative operator in terms of modal semantics, but only provides a cursory syntactic treatment. Similarly, Portner (2004a; 2007) begins with sentence-level semantic units, and explores how they are handled by the pragmatic component of the grammar. A later attempt at mapping this approach to a syntactic model (Zanuttini et al. 2012) does not yield a satisfactory explanation of the interface phenomena present in imperatives.

It is impossible to address all the shortcomings of prior accounts of imperatives in a single dissertation. I will attempt to make significant progress in four main areas. Chapter 2 looks at two prior accounts, the so-called *modal analysis* and *property analysis*, in detail, and in light of their faults opts for a third option, a *preference analysis*. Chapter 3 looks at the distribution of imperative utterances in conversation from two angles: *challengeability* and *relevance*. Challenge tests are applied to see what kind of utterances can follow an imperative, and are diagnostic of the imperative's effect on the discourse. Relevance applies to imperatives themselves and establishes criteria for when they can be felicitously uttered. Chapter 4 looks at several facts of clausal syntax and word order in imperatives, largely focusing on English. Adopting an extended model of the clausal left periphery explains heretofore unanalyzed word order patterns, including information-structural fronting within imperatives and syntactic embedding of imperatives in indirect discourse. Chapter 5 combines the semantic and syntactic insights of the previous two chapters to provide a unified mapping of clausal meaning onto clausal syntax, encompassing declaratives, interrogatives, and imperatives. Additionally, I propose a preliminary semantics for imperative embedding, the first of its kind.

Chapter 2, **Previous Approaches to Imperatives**, covers three approaches to imperative form and meaning in turn.

§2.2 addresses the modal analysis of Kaufmann (2011), which argues that the semantics of imperatives is extremely similar to that of modal declaratives. Sentences such as *You must take out the trash* are treated as ambiguous between a *descriptive* interpretation, which asserts an existing obligation, and a *performative* interpretation, which creates a new obligation. When used in the latter way, the *performative declarative modal* is treated as semantically equivalent to the imperative *Take out the trash!*. Thus Kaufmann (2011) builds the semantics for imperatives on the modal semantics of Kratzer (1981), but with additional “presuppositional” constraints on when imperative utterances are felicitous. I point out that choosing an ordering source for modal meaning contained within an imperative is problematic. Furthermore, some of the constraints on imperative use, such as enforcing a non-past commanded action, appear to be too strong; others, such as requiring the speaker to be in a given epistemic state, are redundant when taking into account basic principles of discourse.

§2.3 explores the property analysis of Portner (2004a; 2007), which takes an opposite view of imperative meaning. Instead of assimilating it to the meaning of another construction, imperatives are assigned a type of meaning represented by no other clause type. As properties, imperatives are taken to denote functions from individuals to sets of worlds, with the domain of individuals limited to the addressee(s) of the imperative. When sentences are uttered, based on the type of meaning they denote, they are apportioned to different components of the discourse representation: propositions to the Common Ground, sets of propositions to the Question Set, and properties to one of several To-Do Lists. The number of To-Do Lists can grow quite large, as separate lists are required for each interlocutor (Portner 2004a) and for each type of obligation expressed (Portner 2007). I argue that, apart from being inelegant, this proliferation of discourse structures can be obviated entirely by positing a rich, unified discourse representation.

§2.4 introduces preference semantics (Starr 2010; 2012), which forms the basis of my analysis. Extending the unification of discourse structure begun in Inquisitive Semantics (Groenendijk and Roelofsen 2009), preference semantics encodes declarative, interrogative, and imperative meaning in a single object, a *preference state*, which is a set of ordered pairs of propositions. An imperative characteristically contributes a preference for a proposition over its complement $\langle p, \neg p \rangle$. These preferences (and other preferences that

are part of imperative meaning) are generated by an imperative update rule, which corresponds to the *illocutionary relation* of the clause, a function which takes a discourse context and a proposition, and returns an updated, structured context (Murray 2010). Preference semantics combines the best aspects of the other two analyses, giving imperatives a characteristic semantic representation while allowing imperative meaning to interact directly with declarative and interrogative meaning. This allows for an accurate explanation of imperative relevance (Chapter 3) and the compositionality of clausal meaning (Chapter 5).

Chapter 3 deals with the **Meaning and Behavior of Imperatives in Discourse**, specifically with respect to challengeability and relevance.

§3.2 introduces the concept of *at-issue status* and the challenge tests that diagnose it. Propositions are *at-issue* if they can be directly challenged, i.e. affirming or denying their truth; they are *not-at-issue* if they have to be indirectly challenged, requiring the ordinary progress of the discourse to be suspended so that their truth can be discussed. Imperatives have long been known to resist direct challenges: *Take out the trash!* cannot be felicitously followed by *#That's true* or *#That's false* (Iatridou 2008). However, I show that imperatives resist indirect challenges as well, when the challenged content is the imposition of the obligation. Certain direct challenges succeed with imperatives, if they instead target the commanded action. Thus I conclude that imperatives do make an at-issue contribution, but it is not the characteristic contribution of the imperative. The obligation- or preference-creating content is the illocutionary relation, which is non-propositional, and therefore has no at-issue status.

§3.3 begins by surveying recent work on Relevance (Roberts 1996; 2004; Simons et al. 2011), a felicity condition imposed on all utterances requiring that they further the resolution of the Question Under Discussion (QUD), which encodes the current discourse topic as a set of *potential answers*. On the standard view, for an utterance to be Relevant it must reduce the number of potential answers (be at least a *partial answer* to the QUD), possibly down to a single alternative (a *complete answer*). To compute Relevance for imperatives, non-modal propositional content has to be extracted from them to compare to the potential answers to the QUD. This is difficult under both the modal and property analyses, but simpler on a preference analysis where the preferred proposition is directly accessible. I then show that using the preferred

proposition to compute imperative Relevance makes accurate predictions when compared to various types of questions, so long as information-structural constraints introduced by the QUD are taken into account. Building on these results, in §3.4 I propose a formalization of Relevance within preference semantics. Because preference states contain the alternatives that compose the QUD and can accept new information contributed by any clause type, a simple, fully computable definition of Relevance covers all cases.

Chapter 4 turns to the issue of **Encoding the Imperative Illocutionary Relation** within the structure of the clausal left periphery. Given the semantic and pragmatic motivation for unifying illocutionary relations as a class, I propose to also unify them syntactically. To accomplish this, there must not be any imperative-specific projections in the clausal structure. Since a single CP projection will not suffice for representing major clausal features — matrix vs. subordinate status, clause typing, information structure, and subject licensing — I propose an extension of Rizzi's (1997) articulated left periphery as a universal hierarchy and place illocutionary relations in Force⁰ (§4.2). Word order data from English demonstrates that Force⁰ does not universally drive movement, contra the clause-typing proposals of Han (2000) and Koopman (2007).

English imperatives also exhibit restrictions on information-structural movement, allowing contrastive topicalization but prohibiting non-contrastive topicalization (§4.3). I argue that this is due to contrastive topics being hosted in FocusP, an independent position, while non-contrastive topics are hosted in a multipurpose CP which cannot contain an imperative [Force] feature and a [+Topic] feature simultaneously. Tests involving information-structural movement also provide new evidence for the locus of *do*-support in negative imperatives in English, which I determine to be Focus⁰.

§4.4 examines the content of English imperative CP further with data on embedding of imperative clauses and extraction from them. The absence of a complete ban on extraction from embedded imperatives shows that they have an open “escape hatch” position, so Spec CP cannot be filled by an Operator. Imperatives do not pattern with either weak or strong islands, but exhibit a different set of extraction restrictions, which I argue are largely due to the possibility or impossibility of movement within the imperative clause.

Having discussed syntactic, semantic, and pragmatic aspects of imperatives separately in the preceding chapters, Chapter 5 is devoted to **Imperatives at the Syntax/Semantics Interface**.

Despite the fact that preference semantics is designed to operate on fully-formed propositional constituents, it can be mapped onto clausal structure in a compositional manner (§5.2). The foundation of the approach I propose is the Clause Typing Hypothesis of Cheng (1991): “All clauses contain an element that scopes over a propositional constituent (TP) and specifies its discourse function.” Illocutionary relations occupy Force^0 , and are functions from propositions to discourse updates. Since a discourse update is, in turn, a function from preference states to preference states, the type of Force^0 is $\langle st, rr \rangle$, where r is the semantic type of a preference state (a set of pairs of propositions). Thus the content of any well-formed matrix clause is an update $\langle rr \rangle$ and is formed in a compositional manner. I also show that in the allegedly compositional semantics of Zanuttini et al. (2012), it is not possible to define the meaning of Jussive⁰ in isolation; this is in contrast to the preference analysis, where the denotation of imperative Force^0 is simply $\lambda p . !p$.

The final contribution of the dissertation is a preliminary semantics for embedding imperatives under verbs of communication, such as English *say* (§5.3). Just like matrix clauses, embedded clauses contain Force^0 , so they must denote updates of type $\langle rr \rangle$. The ability to embed a clause thus requires an appropriate embedding verb that can take an update as one of its arguments. I propose that verbs of communication are of type $\langle rr, e, st \rangle$: functions from updates and individuals to sets of worlds. Based on the semantics given in Starr (2010) for embedding interrogatives under *wonder*, I provide a preliminary definition of English *say*, which can embed clauses of any type (e.g. *John said that he jumped*, *John said who jumped*, *John said jump!*). *Wonder* relies on pairing preference states with individuals to indicate their internal information states; *say* uses pairs that indicate *speaker-oriented discourse states*.

There are many open issues in the study of imperatives that I did not have the time or space to address in this dissertation. I discuss some of these in the concluding remarks (Chapter 6). For one, there is much room for cross-linguistic application of the preference analysis put forth here. The surprising discoveries of new facts about English — imperatives’ sensitivity to QUD type, the distinction between contrastive

and non-contrastive topicalization, the exact position of *do*-support, and the mechanisms for embedding imperative clauses — are significant enough to receive primary attention. The preference analysis accounts for all of these facts in a unified system.

CHAPTER 2
PREVIOUS APPROACHES TO IMPERATIVES

2.1 Introduction

This chapter outlines three semantic analyses of imperatives and how they interface with syntax and pragmatics. Each of the three analyses represents imperative meaning with a different type of semantic object, and thus makes different predictions about how those objects are derived and interpreted. The chapter is organized so that each section covers a single analysis.

§2.2 describes and critiques the *modal analysis* of Kaufmann (2011). This analysis assimilates the meaning of imperatives to that of modal declaratives, with some additional restrictions on when imperatives can be felicitously uttered. Although imperatives and modal declaratives do overlap in meaning and use, I argue that it is impossible to equate one with the other. I provide preliminary data on how the two constructions diverge, and I elaborate on the matter in Chapter 3.

§2.3 describes and critiques the *property analysis* of Portner (2004a; 2007) and later interface work based upon it. Opposite to the modal analysis, imperative meaning is represented as properties (functions from individuals to truth values); no other clause types denote properties. This necessitates fragmenting the discourse representation, making it difficult to ascertain the relationship between utterances of different types within a discourse. Additionally, the syntactic analysis of imperative properties proposed in Zanuttini (2008) and Zanuttini et al. (2012) requires an additional, imperative-specific projection; I return to this issue in Chapter 4.

§2.4 describes and endorses *preference semantics* (Starr 2010; 2012), which forms the basis of the *preference analysis* I propose in the remaining chapters of this dissertation. Preference semantics is a dynamic semantic system that unifies declarative, interrogative, and imperative meaning in a single discourse representation: a *preference state*. Each clause type makes a different characteristic contribution to the discourse

as specified by dynamic update rules, but there is no segregation of information as in the property analysis. Many facts about imperative use that have to be stipulated in the other models fall out as natural consequences of pragmatic reasoning in the preference analysis.

2.2 Imperatives as Modals

2.2.1 Reducing Imperatives to Other Constructions

There have been several accounts of imperatives that try to explain their properties in terms of related declarative sentences. Hamblin (1987) discusses three long-standing theories that reduce imperatives to declaratives (2), either through use of a modal or by embedding under an explicitly performative verb. He argues that none of these reductions are perfect equivalents of the imperative. Kaufmann (2011) revisits these theories, and introduces another potential modal reduction, equating imperatives with necessity modals in general, but particularly those with *must* (3).

- | | | |
|-----|--------------------------------------------|-----------------------------|
| (1) | Close the door! | imperative |
| (2) | a. You will close the door(!) ¹ | <i>you-will</i> reduction |
| | b. You should close the door(!) | <i>you-should</i> reduction |
| | c. I order you to close the door(!) | performative embedding |
| (3) | You must close the door(!) | <i>you-must</i> reduction |

¹Many authors either have no convention for whether they punctuate examples with an exclamation point or period, while others use exclamation points for all sentences that express a command. I only use an exclamation point to punctuate sentences that are syntactically imperative; an exclamation point in parentheses indicates that it was present in the original source, but I do not judge the sentence to be an imperative.

Early explanations of these reductions were founded on generative semantic theories, in which the surface form of one sentence may be the result of directly transforming the surface form of another sentence. Under these systems, imperatives were derived from declarative modals by suppressing pronunciation of the subject *you* and the modal *will*, *should*, or *must*. Since more recent syntactic theories do not permit direct manipulation of this sort, a different explanation is required of anyone who seeks to equate imperatives with a declarative construction.

Kaufmann (2011) (and her earlier work in Schwager (2006)) adopts just such an approach, arguing that despite their syntactic differences, imperatives and certain declarative modals have largely identical semantic representations. This is accomplished by the presence of an imperative operator, Op_{imp} , which is present in the clausal left periphery of imperatives. Kaufmann defines Op_{imp} as taking the same sort of arguments as a lexical modal in the verbal domain, drawing on the framework of Kratzer (1981) and her subsequent work on graded modality.

Kaufmann's (2011) analysis is based on the similarity in function between imperatives and certain uses of declarative modals expressing necessity. It is in the nature of modal sentences that they are underspecified as to what type of modality they express: logical, deontic, epistemic, etc. (Kratzer 1981). Additionally, modals may be used descriptively or performatively. Descriptive uses "[report on] the way the world is with respects to... possibilities and necessities," whereas performative uses "change the way the world is in such respects." (Kaufmann 2011:58). Contextual factors, such as those supplied in (4) and (5), are usually necessary to identify which way a modal sentence is being used.

(4) *Descriptive use of 'must'*

Context: Patrick and Veronica are housemates with several other people. They have established a rotating chore schedule and posted it in the common room. Patrick looks at the chart, and sees that it is Veronica's assignment to take out the trash this week.

Patrick (to Veronica): You must take out the trash.²

²The use of 'must' in this scenario seems rather stilted or formal. This should not be of much concern, because replacing

(5) *Performative use of 'must'*

Context: Patrick and Veronica are housemates with several other people. Patrick has been appointed to make sure that the house is well-maintained by enlisting the help of others as necessary.

At a house meeting, he is giving chore assignments for the week.

Patrick (to Veronica): You must take out the trash(!)

In both (4) and (5), Veronica is expected to take out the trash after Patrick's utterance. In (4), the obligation already held before Patrick's utterance. As such, the modal is used descriptively, since it does not change the deontic necessities that hold in this world; even if Veronica is ignorant of her duty, the most that the descriptive modal accomplishes is to inform her of it. Contrast the use of the modal in (5). In this case, Patrick has altered the facts about deontic necessities by assigning Veronica a new duty. Uses of this sort are called *performative declarative modals* (*performative* to distinguish them from descriptive modals; *declarative* to distinguish them from imperatives). One characteristic of performative declarative modals is that in many contexts, an imperative sentence can be used instead, achieving the same effect of creating a new norm or duty. In (5), Patrick's utterance could perfectly well be substituted by the imperative *Take out the trash!*. This potential substitution is what leads Kaufmann (2011) to argue that imperatives should be analyzed as modals. However, there do seem to be scenarios in which they are not interchangeable, as in (6) below.³

(6) Context: Patrick and Veronica are housemates with several other people. They have established a rotating chore schedule and posted it in the common room. Patrick looks at the chart, which indicates that this week it is Roger's turn to take out the trash.

a. Patrick (to Veronica):

#You must take out the trash.

must with the more natural *have to* does not affect the modal meaning in any way.

³In addition to the case I present here, see §3.3 of Portner (2007) for arguments as to why the claim that imperatives and performative declarative modals are interchangeable is an oversimplification.

- b. Patrick (to Veronica):
✓Take out the trash!

In the context of (6), the descriptive use of the modal is possible, although it is a false statement. (Patrick could utter it felicitously if, for example, he had misread the chart or forgot what day of the month it was.) On the other hand, the performative use seems unavailable. If the performative declarative modal and imperative are identical, then the imperative should be unavailable as well, yet using an imperative in this scenario is possible. It is clear that Patrick is creating a new norm based on criteria different from the previous public knowledge, but it is created just the same. This fact is contrary to Kaufmann's general program, which as we will see, is that imperatives are identical to performative declarative modals except that they have *more* restrictions on the contexts in which they can be uttered and their range of possible meanings.

2.2.2 The Graded Modal Hypothesis

Similarities between declarative modals and imperatives can be expressed in any semantics that represents modality in natural language. Kaufmann (2011) uses the highly familiar graded modality theory of Kratzer (1981). In Kratzer's theory, necessity and possibility are treated as universal and existential quantification, respectively, as applied to a specially selected set of worlds. The process of selecting those worlds relies upon two *conversational backgrounds*, functions that take a world and return a set of propositions.⁴ Kaufmann (2011) augments the theory as presented in Kratzer (1981) by adding a temporal parameter as well. The arguments of modals are summarized in (7) below; of those, all except the prejacent (the proposition whose necessity or possibility is being expressed by the full modal statement) are used to calculate the set of "best worlds" to which the modal quantification applies.

⁴See Kratzer (1991:641ff.) for a more detailed definition, several basic examples of conversational backgrounds, and discussion of how they differ from traditional accessibility relations.

(7) *Arguments of graded modals*

	Argument	Semantic type
f	modal base	$\langle i, \langle s, \langle st, t \rangle \rangle \rangle$
g	ordering source	$\langle i, \langle s, \langle st, t \rangle \rangle \rangle$
t	time of evaluation	i
P	prejacent	$\langle i, st \rangle$
w	world of evaluation	s

The modal base f takes the world of evaluation w and returns a set of propositions. Taken together, this set of propositions characterizes a set of worlds under consideration, the intersection of the returned propositions, written $\cap f(w)$. This set of worlds may be more restricted, less restricted, or identical to the set of live possibilities provided by the utterance context. A special case is when f returns an empty set of propositions, in which case $\cap f$ is W , the set of all logically possible worlds.

Like f , the ordering source g also takes a world of evaluation and returns a set of propositions. This set is used to generate a preorder on the worlds identified by the modal base.⁵

(8) *Preorder determined by g*

$$\forall v, z \in W : v \leq_{g(w)} z \text{ iff } \{p \mid p \in g(w) \ \& \ z \in p\} \subseteq \{p \mid p \in g(w) \ \& \ v \in p\}$$

(Kaufmann 2011:84, ex. 28)

The preorder, as defined in (8), states that a world v is g -better than (or equal to) another world z if every g -proposition that is true in z is also true in v . Thus, worlds in which the most g -propositions are true are said to be g -best, or simply the *best worlds*. The set of best worlds relative to a modal base, ordering source, and world of evaluation are referred to as O .

⁵Kratzer (1991), citing Lewis (1981), calls the ordering relation established by g a *partial order*. According to ordering theory, this is technically incorrect, as partial orders must be antisymmetric, i.e. not permitting two distinct elements to be ranked equally. g does allow ties in its ranking, and is thus a *preorder*. See Swanson (2011) for further discussion of these distinctions, including references to the relevant linguistic literature.

(9) *Set of best worlds* O

$$O(f, g, w, t) := \{v \in \cap f(w) \mid \forall z \in \cap f(w) : \text{if } z \leq_{g(w,t)} v \text{ then } v \leq_{g(w,t)} z\}$$

(after Kaufmann 2011:84, ex. 30)

The formal definition of O in (9) states: of the worlds characterized by a modal base evaluated at a particular world (and time), the best worlds are those which are g -better than (or equal to) all other worlds characterized by the modal base.

The heart of Kaufmann's proposal is that lexical modals like *must* and *should* determine the best worlds and quantify over them in the same way that the unpronounced imperative operator, Op_{imp} , does. Thus the denotations given for *must* (10) and Op_{imp} (11) are extremely similar.

$$(10) \quad \llbracket \text{must} \rrbracket^c = \lambda f \lambda g \lambda t \lambda P \lambda w . (\forall w' \in O(f, g, t, w)) [P(t)(w')]$$

(after Kaufmann 2011:96, ex. 53)

$$(11) \quad \llbracket \text{Op}_{imp} \rrbracket^c = \lambda f \lambda g \lambda t \lambda P \lambda w . (\forall w' \in O(f_{CG(C)}, g, C_T, w)) [P(t)(w')]$$

(after Kaufmann 2011:133, ex. 11)⁶

The primary semantic difference between these two modal elements lies in the arguments of O . This will necessarily result in different truth conditions, since the universal quantification is over the members of O . For *must*, there is greater variability of O , since all four of its arguments are bound variables, whereas for Op_{imp} , two of them (f and t) have been replaced with constants ($f_{CG(C)}$ and C_T). $f_{CG(C)}$ is a constant function that “to each world... assigns the common ground of the utterance context” (Kaufmann 2011:132), and C_T is the utterance time. This difference stipulates that imperatives can only be evaluated against the current context set and time.

⁶Although this definition is listed by Kaufmann as “preliminary”, the portion presented here does not change at all in the final definition given at Kaufmann (2011:162, ex. 63); the only additions are the several “presuppositional” definedness conditions imposed on imperatives. For now, I leave aside those conditions and their effects, returning to them in (31) ff.

To see the effects of using these constants in the computation of imperative meaning, consider the following example, showing the application of $\llbracket \text{Op}_{imp} \rrbracket$ to a simple imperative sentence, *Get up!*. Kaufmann (2011) states the truth conditions of this sentence as in (12).⁷

$$(12) \quad \llbracket \llbracket \text{Op}_{imp} f g t \rrbracket \llbracket \text{IMPPRO get up} \rrbracket \rrbracket^c = 1 \text{ iff}$$

$$(\forall w \in O(f_{CG(C)}, g, C_T, C_W)) [(\exists e) [\tau(e) \subseteq t \ \& \ \text{get-up}(C_A)(e)(w)]]],$$

where $g =$ ‘what the speaker orders’

presupposes: $\neg(t < C_T)$ (Kaufmann 2011:132, ex. 10)

In prose: the denotation of *Get up!* indicates that of the worlds under consideration in the utterance context, in all of them that are best according to what the speaker orders, the addressee gets up. Furthermore, it is separately presupposed that the action of getting up occurs at a non-past time. The following derivation shows the proposition expressed by the same imperative sentence.

$$(13) \quad \llbracket \llbracket \text{Op}_{imp} f g t \rrbracket \llbracket \text{IMPPRO get up} \rrbracket \rrbracket^c =$$

$$(14) \quad \llbracket \llbracket \text{Op}_{imp} f g t \rrbracket \rrbracket^c (\llbracket \text{IMPPRO get up} \rrbracket^c) =$$

$$(15) \quad \llbracket \text{Op}_{imp} \rrbracket^c (\llbracket f \rrbracket^c) (\llbracket g \rrbracket^c) (\llbracket t \rrbracket^c) (\llbracket \text{IMPPRO get up} \rrbracket^c) =$$

$$(16) \quad \llbracket \text{Op}_{imp} \rrbracket^c (\llbracket f \rrbracket^c) (\llbracket g \rrbracket^c) (\llbracket t \rrbracket^c) (\llbracket \text{get up} \rrbracket^c (\llbracket \text{IMPPRO} \rrbracket^c)) =$$

$$(17) \quad \llbracket \text{Op}_{imp} \rrbracket^c (\llbracket f \rrbracket^c) (\llbracket g \rrbracket^c) (\llbracket t \rrbracket^c) (\llbracket \text{get up} \rrbracket^c (C_A)) =$$

$$(18) \quad \llbracket \text{Op}_{imp} \rrbracket^c (\llbracket f \rrbracket^c) (\llbracket g \rrbracket^c) (\llbracket t \rrbracket^c) ([\lambda x'' \lambda t'' \lambda w'' . \exists e [\tau(e) \subseteq t'' \ \& \ \text{get-up}(x'')(e)(w'')]](C_A)) =$$

⁷In the subsequent examples, IMPPRO is the null imperative subject pronoun. Its denotation is a function that returns the addressee of the current context, C_A .

- (19) $\llbracket Op_{imp} \rrbracket^c (\llbracket f \rrbracket^c) (\llbracket g \rrbracket^c) (\llbracket t \rrbracket^c) (\lambda t'' \lambda w'' . \exists e [\tau(e) \subseteq t'' \& \text{get-up}(C_A)(e)(w'')]) =$
- (20) $\lambda f' \lambda g' \lambda t' \lambda P \lambda w . (\forall w' \in O(f_{CG(C)}, g', C_T, w))[P(t)(w')] (\llbracket f \rrbracket^c) (\llbracket g \rrbracket^c) (\llbracket t \rrbracket^c)$
 $(\lambda t'' \lambda w'' . \exists e [\tau(e) \subseteq t'' \& \text{get-up}(C_A)(e)(w'')]) =$
- (21) $\lambda g' \lambda t' \lambda P \lambda w . (\forall w' \in O(f_{CG(C)}, g', C_T, w))[P(t)(w')] (\llbracket g \rrbracket^c) (\llbracket t \rrbracket^c)$
 $(\lambda t'' \lambda w'' . \exists e [\tau(e) \subseteq t'' \& \text{get-up}(C_A)(e)(w'')]) =$
- (22) $\lambda g' \lambda t' \lambda P \lambda w . (\forall w' \in O(f_{CG(C)}, g', C_T, w))[P(t)(w')] (c(g)) (c(t))$
 $(\lambda t'' \lambda w'' . \exists e [\tau(e) \subseteq t'' \& \text{get-up}(C_A)(e)(w'')]) =$
- (23) $\lambda g' \lambda t' \lambda P \lambda w . (\forall w' \in O(f_{CG(C)}, g', C_T, w))[P(t)(w')] (g_1) (t_1)$
 $(\lambda t'' \lambda w'' . \exists e [\tau(e) \subseteq t'' \& \text{get-up}(C_A)(e)(w'')]) =$
- (24) $\lambda P \lambda w . (\forall w' \in O(f_{CG(C)}, g_1, C_T, w))[P(t_1)(w')]$
 $(\lambda t'' \lambda w'' . \exists e [\tau(e) \subseteq t'' \& \text{get-up}(C_A)(e)(w'')]) =$
- (25) $\lambda w . (\forall w' \in O(f_{CG(C)}, g_1, C_T, w))[(\lambda t'' \lambda w'' . \exists e [\tau(e) \subseteq t'' \& \text{get-up}(C_A)(e)(w'')])(t_1)(w')] =$
- (26) $\lambda w . (\forall w' \in O(f_{CG(C)}, g_1, C_T, w))[\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')]]$

The result is a proposition of type $\langle st \rangle$, having the same truth conditions as in (12). However, some steps taken in the course of the derivation merit discussion, particularly those regarding the instantiation of the four arguments of O . I will return to this topic in §2.2.3 below. For now, I will use the proposition derived in (26) to evaluate the imperative relative to sample contexts and the modal parameters they provide.

The simplest model in which to evaluate $\llbracket \text{Get up!} \rrbracket$ is one in which it is a discourse-initial utterance. Then we can assume that the common ground has not been linguistically restricted, and is open to all possible worlds. The two salient propositions at the time of utterance are that the addressee gets up, and that

the speaker orders the addressee to get up. The model thus consists of the following.

(27) *Sample model for evaluating ‘Get up!’*

$$CG(c) = \emptyset$$

$$\cap CG(c) = W = \{w_0, w_1, w_2, w_3\}$$

$$p = C_A \text{ gets up} = \{w_0, w_1\}$$

$$q = C_S \text{ orders } p = \{w_0, w_2\}$$
⁸

One crucial aspect of the context left unspecified in (27) is what world is the world of utterance; this world will determine the ordering source g used in determining the best worlds. (Recall that $f_{CG(C)}$ and C_T are constants, and therefore not contingent upon the world of evaluation.) g has been qualitatively described as ‘what the speaker orders’ in (12). This ordering source can be formalized as in (28).

(28) *‘What the speaker orders’*

$$g_1 = \lambda w_{\langle s \rangle} \lambda r_{\langle st \rangle} \cdot [C_S \text{ orders that } r \text{ in } w]$$

Which world from the model acts as the input to this function will determine the output of g . First let us consider the case where $C_W = w_0$, in which both the addressee gets up and the speaker commands it.

(29) $\llbracket \text{Get up!} \rrbracket^c$ where $C_W = w_0$ and $g_1 = \lambda w_{\langle s \rangle} \lambda r_{\langle st \rangle} \cdot [C_S \text{ orders that } r \text{ in } w]$

$$\lambda w \cdot (\forall w' \in O(f_{CG(C)}, g_1, C_T, w)) [\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')]] (C_W) =$$

$$(\forall w' \in O(f_{CG(C)}, g_1, C_T, C_W)) [\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')]] =$$

⁸There is room for debate on the ontology of propositions like q and whether they have a place in defining the common ground of a conversation. Kaufmann explicitly does make room for meta-linguistic propositions in her theory, so considering q on a par with other propositions is in accordance with her approach.

$$(\forall w' \in \{v \in \cap CG(c) \mid \forall z \in \cap CG(c) : \text{if } z \leq_{g_1(w_0)} v \text{ then } v \leq_{g_1(w_0)} z\})[\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')]] =$$

$$(\forall w' \in \{v \in \cap CG(c) \mid \forall z \in \cap CG(c) : \text{if } z \leq_{[p]} v \text{ then } v \leq_{[p]} z\})[\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')]] =$$

$$(\forall w' \in \{v \in \{w_0, w_1, w_2, w_3\} \mid \forall z \in \{w_0, w_1, w_2, w_3\} : \text{if } z \leq_{[p]} v \text{ then } v \leq_{[p]} z\})[\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')]] =$$

$$(\forall w' \in \{w_0, w_1\})[\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')]]$$

The result of (29) seems to be an ideal result: g_1 ranks just the p -worlds highest, and the imperative makes a true statement, namely that all of the p -worlds are in fact p -worlds. However, this correct result comes at the price of making a non-trivial assumption: that the action ordered by the imperative in progress counts as a proposition that C_S orders in the actual world at the time of utterance. Intuitively, it seems that the order to carry out p does not exist until after the imperative is uttered (recall the scenarios in (4)–(6)). Following this intuition, assume that $C_W = w_3$, the world in which the addressee does not get up and the speaker does not command him to.

$$(30) \quad \llbracket \text{Get up!} \rrbracket^c \text{ where } C_W = w_3 \text{ and } g_1 = \lambda w_{\langle s \rangle} \lambda r_{\langle st \rangle} . [C_S \text{ orders that } r \text{ in } w]$$

$$\lambda w . (\forall w' \in O(f_{CG(C)}, g_1, C_T, w))[\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')]] (C_W) =$$

$$(\forall w' \in O(f_{CG(C)}, g_1, C_T, C_W))[\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')]] =$$

$$(\forall w' \in \{v \in \cap CG(c) \mid \forall z \in \cap CG(c) : \text{if } z \leq_{g_1(w_3)} v \text{ then } v \leq_{g_1(w_3)} z\})[\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')]] =$$

$$\text{up}(C_A)(e)(w')] =$$

$$(\forall w' \in \{v \in \cap CG(c) \mid \forall z \in \cap CG(c) : \text{if } z \leq_{\emptyset} v \text{ then } v \leq_{\emptyset} z\})[\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')] =$$

$$(\forall w' \in \{v \in \{w_0, w_1, w_2, w_3\} \mid \forall z \in \{w_0, w_1, w_2, w_3\} : \text{if } z \leq_{\emptyset} v \text{ then } v \leq_{\emptyset} z\})[\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')] =$$

$$(\forall w' \in \{w_0, w_1, w_2, w_3\})[\exists e [\tau(e) \subseteq t_1 \& \text{get-up}(C_A)(e)(w')]]$$

Because in w_3 there are no propositions ordered by the speaker, g_1 is empty and cannot order the worlds from the modal base in any way. Thus all worlds in the modal base are equally good (or bad), and the universal quantifier scopes over the entire context set. The result is a false modal statement. Thus, we see that in order for Op_{imp} to function properly, it must be assumed that the ordered proposition counts as being among the speaker's orders at the same time as the imperative utterance is being made.

To mitigate against problems like the one that arose in (30), several additional constraints are incorporated into the definition of Op_{imp} . Kaufmann (2011) calls these, taken together, the “presuppositional meaning component” of the imperative operator; however, they are not presuppositional in the sense of Stalnaker (1979). For example, the constraint on the time at which the commanded action takes place, $\neg(t < C_T)$, restricts the available assignments of a bound variable within $\llbracket \text{Op}_{imp} \rrbracket$. There is no way to encode this fact as a common ground proposition. Thus it must not be taken as a Stalnakerian presupposition, but either as a (pragmatic) felicity condition or a (semantic) definedness condition.⁹ Altogether, there are four such conditions in the final definition of $\llbracket \text{Op}_{imp} \rrbracket$.

⁹All of the conditions on Op_{imp} included in Kaufmann (2011), as well as some others, are presented in Schwager (2006) as definedness conditions, i.e. the entire imperative sentence is undefined if one or more of them fails to be met. See (Kaufmann 2011:144, fn. 16) for discussion of this distinction and her decision to adopt the pragmatic view.

(31) $\llbracket \text{Op}_{imp} \rrbracket^c = \lambda f \lambda g \lambda t \lambda P \lambda w . (\forall w' \in O(f_{CG(c)} \cup f, g, C_T, w)) [P(t)(w')]$

presupposes:

Event Frame: $\neg(t < C_T)$

Authority Condition: $f, g \in AUTH'(C_S)(c)$

Epistemic Uncertainty: for the precontext c' of c ,

$CS(c') \subseteq \lambda w . (\exists w' \in Bel'_{C_S}(C_T)(w)) (\exists w'' \in Bel'_{C_S}(C_T)(w)) [\neg P(t)(w') \& P(t)(w'')]$

Ordering Source Restriction: either in c there is a salient decision problem such that in c the imperative provides an answer to it, g is any prioritizing ordering source, and speaker and addressee consider g the relevant criteria for resolving the decision problem;
or else, in c there is no salient decision problem such that the imperative provides an answer to it in c , and g is speaker bouletic.

(Kaufmann 2011:162, ex.63)

The Event Frame constraint ensures that the completion of the commanded action occurs at a non-past time. This is less strict than many other claims in the literature that commanded actions must occur entirely in the future.¹⁰ Note that when the event time is instantiated in (23) above, it is a free variable. If the t argument of Op_{imp} is provided in the same manner as for ordinary tensed modals, tense is specified by a separate morpheme (likely T^0). In fact, it has been claimed that several languages, including Dutch (Mastop 2005), Syrian Arabic (Cowell 1964; Palmer 1986), and Estonian (Aikhenvald 2010), allow imperatives to combine with past tense morphology, usually resulting in a counterfactual interpretation.

Mastop (2011) gives a detailed account of the Dutch “pluperfect imperative” construction, which he argues is a true counterfactual. These clauses are morphosyntactically marked with a past participial form of the verb and the inclusion of certain particles, which are glossed only as PRT, but serve an important

¹⁰In her discussion of this topic, Kaufmann (2011:96) refers to Mastop (2005) and Portner (2007) as proponents of the future-only view. It is unclear that Mastop (2005) makes this claim, and Mastop (2011) clarifies the stance that imperatives are a semantic primitive. On this view, imperative clauses can be marked with any tense and aspect, so long as they do not run afoul of independent morphosyntactic restrictions.

grammatical role. For example, the particle *toch* cannot co-occur with an overt subject, and this is taken to be evidence that clauses such as (32) are indeed imperatives. (Dutch, unlike English, does not readily allow overt pronominal or quantificational subjects in imperatives.)

- (32) Was toch lekker thuisgebleven.
 was PRT PRT at.home.stay-pp
 “You should have just stayed at home.” (Mastop 2011:323, ex. 27)

The imperative in (32) is said to be embedded (semantically, not syntactically) under “past tense which can be given an irrealis interpretation.” (Mastop 2011:325). The logical representation of (32) is taken to be the following:

- (33) Irrealis(Made it the case that you went home) (Mastop 2011:325, ex. 37)

Made it the case that you went home is the representation of the semantic imperative, indicated morphosyntactically by the participial verb form. Past tense contributes Irrealis() and scopes outside of the imperative; this interpretation is taken to be specific to Dutch. No past tense proposition is represented in (33), since Mastop (2011) argues that imperatives are primitives and have no propositional content. I argue in §3.2 that imperatives do have propositional content, and that felicitous past-tense imperatives should always be pragmatically interpreted as counterfactual.

Returning to Kaufmann’s (2011) final two conditions on imperative utterances, the Authority Condition and the Epistemic Uncertainty Condition aim to ensure that the speaker has valid grounds for issuing the imperative. Both of these conditions are related to the speaker’s beliefs. The Authority Condition does not enforce any notion of social authority, but rather that the speaker “counts as an authority” on the two conversational backgrounds that are arguments of Op_{imp} .

- (34) x counts as an authority on a conversational background f in c iff

$$\forall w \in CS(c) (\forall \langle w', t' \rangle \in Bel(x)(t)(w)) (\forall p) [p \in f(t')(w') \leftrightarrow p \in f(C_T)(w)]$$

(Kaufmann 2011:149, ex. 43a)

In prose: the speaker counts as an authority on f if for any world consistent with the speaker's beliefs relative to any given world in the context set, the output of f is the same in the belief world as in the utterance world. Thus the Authority Condition imposes a requirement of a certain type of consistency on the part of the speaker, but makes no reference to his relationship with the addressee.¹¹ Similarly, Epistemic Uncertainty solely makes reference to the speaker's beliefs, stating that (immediately prior to the imperative utterance), the speaker must believe that the commanded action may or may not be realized; this is an acknowledgement of the fact that imperatives can be disobeyed. While I agree that "if the speaker is sure that φ is going to happen (or will not happen), then issuing an imperative $\varphi!$ is infelicitous," (Kaufmann 2011:156), I contend that an additional constraint is not necessary to enforce this notion. In §3.4.1, I show that epistemic uncertainty can be accounted for by the general criteria for pragmatic Relevance, and need not be encoded in the imperative operator.

Finally, the Ordering Source Restriction is a broader claim about when an imperative utterance is a fruitful, cooperative contribution to a discourse. While there are certainly pragmatic principles of this sort at play in any discourse, it's not clear that they are brought to bear by virtue of a particular lexical item, such as Op_{imp} . In §3.3, I take a different view on what makes an imperative relevant, relying on comparing the at-issue, propositional content of an imperative against the discourse context. This approach is an extension of Simons et al.'s (2011) theory of relevance, which is based on a model of discourse that tracks the goals of a discourse via a stack of Questions Under Discussion (Roberts 1996). The revision that I propose both fills a gap in Simons et al.'s (2011) formulation of relevance and covers the concerns addressed by the Ordering Source Restriction.

¹¹Of course, there is the possibility that the output of f contains propositions which involve the addressee; however, the definition of authority does not guarantee this in any way.

All of these conditions serve to refine the formal definition of when imperatives are pragmatically acceptable. There is certainly room to debate the way in which they are incorporated into the grammar, but even Kaufmann (2011) has changed stance from her previous work in Schwager (2006) on this issue, and rightly points out that the division of the theory into semantic and pragmatic components is not the most interesting part of the debate about imperative meaning (Kaufmann 2011:144, fn. 16). As such, I conclude my discussion of the felicity conditions here. In the next subsection, I return to the core semantics of the modal analysis, and address some deeper issues that it raises.

2.2.3 Criticism of the Modal Analysis

The modal analysis proposed by Kaufmann (2011) captures many of the basic intuitions about imperatives — foremost that a concept of bestness, like in modals, plays a role in imperative meaning — but the implementation misses some key facts and introduces some technical difficulties as well, mostly due to the denotation of Op_{imp} .

First, I will address the issue that, on Kaufmann’s (2011) analysis, Op_{imp} is strictly more limited than *must* in both the contexts in which it can be used and the modal meanings it can represent. The definitions of these two modal elements are repeated below.

$$(35) \quad \llbracket \text{must} \rrbracket^c = \lambda f \lambda g \lambda t \lambda P \lambda w . (\forall w' \in O(f, g, t, w))[P(t)(w')] \quad = (10)$$

$$(36) \quad \llbracket \text{Op}_{imp} \rrbracket^c = \lambda f \lambda g \lambda t \lambda P \lambda w . (\forall w' \in O(f_{CG(C)}, g, C_T, w))[P(t)(w')] \quad = (11)$$

A declarative modal with *must* should be able to be used in place of an imperative in any circumstance, so long as its *f* and *t* arguments can be instantiated as $f_{CG(C)}$ and C_T . However, some imperatives do not allow substitution with a performative declarative modal. One class of imperatives that behave this way are the sort of commands that appear on written signs.

- (37) Context: a sign posted on a residential lawn, which has been recently fertilized.
- a. Keep off the grass!
 - b. #You must keep off the grass(!)

A potential counterargument to a case like (37) is that the context is defective in this scenario, since there is not a speaker or utterance time *per se*. However, I think this counterargument is not a secure one. Despite the fact that f and t are more restricted in the imperative, they are still contextually determined; the complete unavailability of a context-provided time should make the imperative fail just as badly as the performative declarative modal. Nor can the discrepancy be due to the difference between *you* and *IMPPRO*, as they too are equally context-dependent. Nevertheless, the imperative is the only way to express this type of written command. Thus, imperatives can, in at least some circumstances, perform the task of commanding when a modal cannot, which would indicate that their range of meaning is not a subset of modal meanings.

In the other direction, the limitation imposed by hard-coding the f and t arguments of Op_{imp} causes both technical and practical problems. In technical terms, $\lambda f'$ is vacuous in (21), as there is no bound occurrence of f . More importantly, though, it also precludes imperatives from being evaluated against modal bases not identical to the current context set. Yet there are constructions in which shifting the modal base seems perfectly normal, including in conditionals (38), and commands that invite iterative interpretations (39).

(38) If it's past 8:00, get up! (Otherwise, you can stay in bed.)

(39) When it's cold outside, wear your coat!

If evaluated against a modal base consisting only of the live worlds given the utterance context, these imperatives yield anomalous interpretations. For (38), it should not be the case that the imperative predicts that in all of the best worlds, including ones where it is 7:00, the addressee gets up. One way out of this

problem would be to say that if the restriction imposed by the if-clause does not hold, no modal claim is made by the imperative. However, a parallel explanation fails for (39), which can be uttered on a warm, summer day and still impose a norm upon the addressee.

There is one situation in which Kaufmann (2011) allows the modal base to be something other than the Common Ground: imperatives which give advice. The argument is that in these cases the imperative makes reference to knowledge the speaker has but the addressee does not, and that this non-common knowledge cannot be represented as part of the Common Ground, but must play a role in the imperative meaning. This is accomplished by unioning the Common Ground with an external “set of relevant facts” (Kaufmann 2011:143), notated as $f_{CG(C)} \cup f$ in the final definition of Op_{imp} (31). I fail to see how this accomplishes anything that the ordering source does not. Certainly the ordering source in such a scenario would be able to access the speaker’s private knowledge (as it can access their beliefs, desires, and orders in other scenarios). The process of computing $f_{CG(C)} \cup f$ should have no effect on what worlds are selected as best, and is therefore another vacuous contribution of Op_{imp} .

Next, I address one of the modal arguments that is equally variable for Op_{imp} and *must*, the ordering source g . However, the accessibility of an ordering source for anaphoric reference in a followup utterance varies between modals and imperatives. With a modal sentence, it is possible for a speaker to follow up their modal utterance with a statement about the nature or efficacy of the ordering source (40). The same type of followup comment is not possible with an imperative (41).

(40) A: You must pay your taxes on time(!)
A: ✓However, many people disregard this law.

(41) A: Take out the trash!
A1: #However, many people disobey my orders.
A2: #However, many people don’t do what I want.

In (40), g is a deontic ordering source of the sort “what the law provides” (Kratzer 1991), so each of its member propositions corresponds to an individual requirement imposed by a law. With this type of ordering source in effect, the anaphoric phrase *this law* is able to exploit the fact that g is a set of laws in order to refer to one of its members. This is not the case in (41), where an imperative does not license reference to a proposition in an ordering source. This is not because the type of ordering source being referred to is of a type that is incompatible with an imperative; speaker-bouletic ordering sources of the form $g = \text{‘what the speaker orders’}$ are exactly the sort licensed by the definition of Op_{imp} (31). I take this as evidence that imperatives do not contribute any discourse-accessible ordering source.

Another open issue regarding imperative ordering sources is whether the imperative denotation crucially relies on a circular premise, namely that imperatives impose an order just in case that order is in force at the time of utterance. In (29) and (30) above, it was determined that the proposition being commanded must be part of the output of g in order for the imperative to make a true modal statement. This paradox cannot be resolved by simply atemporalizing ‘what the speaker orders’. Allowing the ordering source access to whatever the speaker orders at any time yields results just as anomalous as the one in which the current command is excluded (30). Consider a simple sequence of two imperatives uttered back to back.

(42) Get up! Get dressed!

Given that two actions are being commanded of the addressee in this scenario, there are four logically possible ordering sources for the second imperative, *Get dressed!*.

- (43) $p = C_A \text{ gets up}$
 $q = C_A \text{ gets dressed}$
- a. $g_1 = \emptyset$
 - b. $g_2 = \{p\}$
 - c. $g_3 = \{q\}$

d. $g_4 = \{p, q\}$

g_1 will not only yield improper results comparable to those in (30), but also ignores the fact that the command to get up has already been given in a previous utterance. Nor should we exclude p from g due to any paradox of circularity, since the current utterance is making a command regarding q . However, if past orders are acceptable for inclusion in g , but the order in progress is not, we get g_2 . This generates a potentially worse result than the false modal claim generated by an empty ordering source; it actually makes *Get dressed!* mean that in all of the worlds where the addressee gets up, the addressee gets dressed. It is obviously not the case that an imperative generates some new entailment based upon previous orders.

g_3 and g_4 are thus our best possible candidates for the ordering source, although they both include q , which goes against the attempt to avoid circularity. g_4 looks least offensive at first, since it takes into account all past and present orders made by the speaker. However, this is actually too restrictive. To include both p and q in the ordering source means that the imperative only quantifies over $(p \wedge q)$ -worlds, i.e. $\llbracket \textit{Get dressed!} \rrbracket \approx$ ‘in every world where the addressee gets up and gets dressed, the addressee gets dressed’. For these two propositions, this interpretation seems harmless, but only because of our real-world knowledge about the order in which these actions usually proceed — it’s very difficult to get dressed while still in bed. It is more problematic when the two commanded actions have no causal or temporal relationship with each other. Take, for example, a scenario in which a mother says the following to her son:

(44) Get dressed! Eat breakfast!

A few minutes later, she enters the kitchen and sees her son eating a bowl of cereal, wearing his pajamas. This may not be what she envisioned when giving her orders, but presuming that after her son finishes eating, he returns to his room and gets dressed, we cannot say that he misunderstood or failed to satisfy the expectations imposed on him. This is an unfortunate consequence for the modal analysis, as it means that g_3 is in fact the optimal ordering source for describing the real-world effect of the imperative. If the ordering

source for an imperative expressing an order must be the singleton set containing the ordered proposition, the derivation of imperative meaning does not merely have a circular component, but is fully circular.

Despite the issues raised above, Kaufmann's (2011) modal analysis of imperatives does ask the right questions regarding the semantics of imperatives: Why are they so similar to certain modals? Why can they accomplish a number of functions, beyond simple commanding? Why are there limitations on the commanded action and the speaker's attitude towards it? And most importantly, why are imperatives obligatorily performative?

The flexibility of graded modals should allow these types of complex distinctions to be encoded in the semantics. However, the end result is that imperatives are not so semantically different from necessity modals after all. Portner (to appear), summarizing the modal analysis, points out that the major differences lie in the "presuppositional" pragmatic component, "which ensure[s] that $[Op_{imp}]$ has a performative, not a descriptive, use." While the various restrictions on imperatives constrain the contexts in which they can be felicitously uttered, they do not seem to directly supply a performative meaning. Furthermore, if, as Portner (to appear) claims, the pragmatic restrictions of Op_{imp} produce performativity, what does this say about performative declarative modals, which lack these lexically encoded restrictions? Perhaps similar restrictions are inferred for performative uses of *must* and *should*, but that would damage the notion that the modal analysis reduces imperatives to a (more basic) declarative construction. As such, although Kaufmann (2011) provides many lessons about what facets of imperatives must be explained by an adequate semantic theory, I leave it with the other reductive analyses (2). One major response to reductive analyses is an approach that has a dedicated mechanism for tracking obligations, their creation, and their satisfaction. I address these theories in the next section.

2.3 Imperatives as Properties

2.3.1 Distinguishing Universal Clause Types

In contrast to the reductive analyses described in §2.2 are approaches that treat the semantics of imperative clauses as fundamentally different from the semantics of other clause types. The best-known of these “clause-typing analyses” was introduced in Portner (2004a), and has formed the basis of a continued research program by Portner and several collaborators (Portner 2007; 2012; Mauck and Zanuttini 2005; Zanuttini 2008; Zanuttini et al. 2012). The core of the proposal by Portner (2004a) is that while declaratives encode propositions $\langle st \rangle$ and questions encode sets of propositions $\langle st, t \rangle$, imperatives encode properties $\langle e, st \rangle$. This segregation by semantic type allows the pragmatic component of the grammar to operate differently on imperatives than on other clause types.

Portner (2004a) observes that the ability to encode declaratives, interrogatives, and imperatives is a universal characteristic of natural language, and that these three clause types are the only universal clause types. He explains this as being a logical consequence of the human language faculty’s mechanism for tracking the state of a discourse, obviating the need to encode clause types directly in the syntax (2004a:4). The discourse representation is composed by adding the denotata of matrix sentences to sets containing denotata of like type. For assertions, this is a set of propositions, the Common Ground (following Stalnaker 1979). For questions, this is a set (or stack) of Questions Under Discussion (Roberts 1996). For imperatives, however, there is not a single set of properties. Rather, each participant in the discourse has their own set of properties, called their To-Do List. One justification for using properties to encode imperatives is that it solves the question of why imperative meaning is not truth-evaluable: it is non-propositional. However, since imperative properties do not in and of themselves specify who they are predicated of, Portner (2004a; 2007) employs a pragmatic function to sort them into several To-Do Lists — indexed to each discourse participant — so that the appropriate individual can be identified. Thus imperatives are unique among the universal clause types in that they are represented in the discourse not by a single set of semantic

objects, but by several participant-specific sets.

Under this view of discourse, the type (and content) of a sentential denotation should uniquely identify the component of discourse to which it will be added. For declaratives and interrogatives, semantic type suffices; for imperatives, an additional domain restriction specifies the target To-Do List. The prototypical domain restriction is that the property applies to the addressee(s) in the current context.¹² If no other type of restriction is made, the property is added to the To-Do List(s) of the addressee(s), and is not added to any others.

(45) $\llbracket \text{Sit down!} \rrbracket = [\lambda w \lambda x : x = \text{addressee}_C . x \text{ sits down in } w]$ (Portner 2007:358, ex. 15)

The To-Do List of a given participant will contain properties roughly of the form given in (45). In the next subsection, I will discuss the exact mechanics for adding properties to To-Do Lists in the system of Portner (2004a; 2007); in §2.3.4 below, I discuss some issues that arise due to the fact that imperative denotata and the elements of To-Do Lists are not identical.

2.3.2 Operating with To-Do Lists

The To-Do List of a participant in a conversation is incrementally built by utterances of imperative sentences. Like the Common Ground, at the outset of a conversation all participants' To-Do Lists start in some base state.¹³ All sentential denotata which are properties get delivered to the To-Do List function T , which then updates the discourse context by adding the property to the appropriate To-Do List.

¹²Other restrictions are possible within Portner's (2004a) theory; what domain restrictions can be encoded varies from language to language. All languages allow restriction to the addressee, but some allow restrictions to the speaker or the speaker and addressee together. Portner (2004a; 2007) notes that these other types of *jussive* clauses are present in Korean. See Zanuttini et al. (2012) for detailed discussion of the syntax and semantics of Korean jussives.

¹³The base state of To-Do Lists, like the Common Ground, may be non-empty. When modeling the Common Ground, certain basic facts may be mutually assumed between participants at the outset of a conversation. Likewise, basic deontic norms (such as "Do not murder anyone") may be assumed to be in a base To-Do List. Portner (2012) discusses some of these cases and their relation to the broader linguistic and philosophical literature on permission.

- (46) a. The To-Do List function T assigns to each participant α in the conversation a set of properties $T(\alpha)$.
- b. The canonical discourse function of an imperative clause φ_{imp} is to add $\llbracket \varphi_{imp} \rrbracket$ to $T(\textit{addressee})$.
Where C is a context of the form $\langle CG, Q, T \rangle$:
 $C + \varphi_{imp} = \langle CG, Q, T[\textit{addressee}/(T(\textit{addressee}) \cup \llbracket \varphi_{imp} \rrbracket)] \rangle$
(Portner 2007:357, ex. 14)

The update performed by the utterance of an imperative in a context does not alter the Common Ground or Question Set, but does alter the value of a particular individual / To-Do List pair specified in the To-Do List function.

Once a To-Do List is populated, its practical function is to guide the rational course of action of the participant to whom it corresponds. Formally this is represented by calculating a partial order of worlds based on the properties contained on the To-Do List.

(47) *Partial ordering of worlds*

For any $w_1, w_2 \in \cap CG$ and any participant i :

$w_1 <_i w_2$ iff for some $P \in T(i)$, $P(w_2)(i) = 1$ and $P(w_1)(i) = 0$,

and for all $Q \in T(i)$, if $Q(w_1)(i) = 1$ then $Q(w_2)(i) = 1$

(Portner 2007:358, ex. 16)

Portner (2007) compares the partial order generated by To-Do Lists to the preorder generated by the ordering source g from Kratzer's (1981) theory of modals, which forms the foundation for the modal analysis of imperatives presented in Kaufmann (2011) (see §2.2 for details of the modal theory). The major conceptual difference between the two theories is the central focus of Portner (2007), which shows how prior utterances of imperatives have effects on the interpretation of later utterances of modal sentences.

(48) A: Pay your taxes!

B: OK. #Should I pay my taxes?

(Portner 2007:369, ex. 42)

(49) A: John, pay your taxes!

B: John should / must / has to pay his taxes.

These facts are used to argue that the To-Do List is used as the ordering source for modal utterances, or at least makes a material contribution to it.

There are two minor discrepancies between To-Do Lists and ordering sources that prevents their direct comparison or interaction. First, the values returned by ordering sources are sets of propositions, not sets of properties. However, there is no reason that the properties on a To-Do List could not be transformed into propositions before being combined with an ordering source. A potential method for computing such a transformation is given in (50) below.

(50) a. $T(\text{John}) = \{[\lambda w \lambda x : x = \text{addressee}_C . x \text{ sits down in } w]\}$

b. $g_{\text{John}} = \{[\lambda w . \text{John sits down in } w]\}$

Second, ordering sources induce preorders, rather than the partial orderings induced by To-Do Lists.¹⁴ Portner (2007) does not specify whether the ranking derived from the ordering source should be strengthened to be a partial order, or whether the ranking contributed by a To-Do List should be weakened to a preorder when used by a modal utterance. Either formal choice should not greatly affect the qualitative generalization that imperatives can disallow (48) or permit (49) certain modals in the following discourse.

Finally, there is the issue of whether the structure of a To-Do List can account for the variable interpretations of imperatives as commands, advice, wishes, etc. The solution offered by Portner (2007) is to

¹⁴The ranking employed by Portner (2004a; 2007) is a true partial ordering, as it is antisymmetric (see fn. 5). Also, when comparing the two ranking methods, be aware of a crucial difference in notation. In Kaufmann's (2011) preorder, $v \leq_{g(w)} z$ is read as " v is g -better than z ", whereas in Portner's partial order, $w_1 <_i w_2$ is read as " w_2 is (i -)better than w_1 ."

maintain multiple “flavors” of To-Do Lists for each participant, or to subdivide a single To-Do List into sections. These flavors correspond to the various types of modality; thus there are deontic To-Do Lists, bouletic To-Do Lists, teleological To-Do Lists, and so on. While Portner says that he prefers subdividing a single To-Do List over creating multiple To-Do Lists (2007:360), it seems that this would further complicate the structure of the discourse. If a To-Do List has recognizable, labeled subcomponents, it can no longer be represented as a simple set of properties. On the other hand, expanding the number of To-Do Lists present in a discourse does not change their semantic type. Since the job of the To-Do List Function T is already to apportion properties to To-Do Lists by individual, the only necessary modification would be to make T also sensitive to the contextual factors that determine the flavor of the imperative utterance.

2.3.3 Encoding Properties with JussiveP

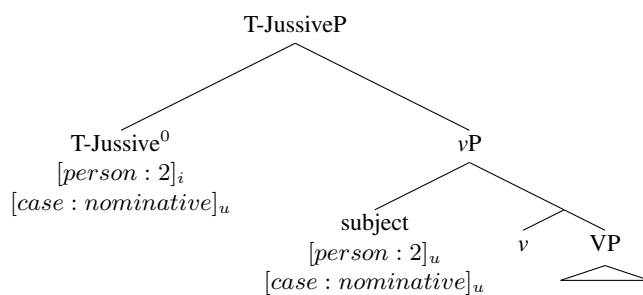
In the preceding discussion of the property analysis, it has been taken for granted that imperatives are of type $\langle e, st \rangle$. The semantic composition of imperative properties and their representation in the syntax is the major focus of Zanuttini (2008), and is carried on in the analysis of Korean jussives in Zanuttini et al. (2012). In this work, the syntactic projection responsible for ensuring that imperative sentences are properties is JussiveP, which is placed in the left periphery.¹⁵ The primary purpose of the Jussive head is the semantic effect of transforming its complement proposition into a property, which can then be assigned to a To-Do List. In other words, Jussive⁰ is an abstraction operator, which binds the subject of the imperative clause; syntactically this is achieved via an Agree relationship. The Jussive head is endowed with an interpretable person feature (2nd person in the case of imperatives), which Zanuttini et al. (2012) argue carries a presupposition about the presence of an addressee. The presupposition introduced by the person feature is exploited both to ensure that the denotation of the clause is a property, and to explain the fact that null subjects are universally licensed in imperatives, even in languages which do not fully permit *pro*-drop

¹⁵JussiveP is based on the earlier AddresseeP of Mauck and Zanuttini (2005). They are conceptually quite similar, and the change in nomenclature was made to indicate that the projection is present in jussive clauses regardless of whether they apply to the addressee (imperatives), speaker (promissives), or both (exhortatives).

in declaratives.

In Zanuttini et al. (2012), the JussiveP is shown to immediately dominate TP, as in (13) below. The relative position of JussiveP and TP is crucial to the analysis, which assumes that, when possible, features on immediately adjacent heads bundle together and probe as a unit. When bundling does occur, the complex is referred to as T-JussiveP.

(51)



(Zanuttini et al. 2012:1246, ex. 23)

Despite the conflation of JussiveP and TP into a single projection in the structure given in (13), Zanuttini et al. (2012) do not intend T-JussiveP to be a stand-in for TP in all imperative clauses, either language-internally or cross-linguistically. When T⁰ has a person feature that is valued differently than Jussive⁰, the heads cannot probe as a bundle.¹⁶ A familiar example of this occurs in English imperatives with third person quantificational subjects.

(52) Everyone_i wash your_i/their_i hands!

Zanuttini et al. (2012) analyze constructions like (52) by positing a null partitive phrase within the quantificational subject. However, they do not compare this construction to its counterpart with an overt

¹⁶T⁰ can either be specified for a person feature when it is initially merged, or it can have its person feature valued by Agree, typically with the subject.

partitive phrase, which does not license both 2nd and 3rd person anaphors.¹⁷

(53) Every one_i of you wash your_i/***their_i hands!

The distinction shown in (53) rules out a partitive analysis, but Zanuttini et al.'s (2012) general approach can still account for the binding facts presented above. Assuming that the partitive-licensing quantifier *every one* obtains its person feature from its partitive complement, both the subject and the Jussive head in (53) bear 2nd person features, ruling out a 3rd person anaphor. For (52), on the other hand, if *everyone* is lexically specified as 3rd person, either the subject or the Jussive head can bind the object anaphor, since binding is a long-distance operation and is not subject to strict intervention constraints. The presence of the Jussive head can thus account for the variety of binding effects found in English imperatives.

Zanuttini et al. (2012) use the person feature of Jussive⁰ to directly supply the domain restriction of the property denoted by the clause. The only intervening stage is to check whether the person feature has a defined denotation in the given context, which Zanuttini et al. (2012) characterize as a “presuppositional” effect of the person feature. For example, a 2nd person value of the person feature is only defined if the current context’s assignment function picks out the current addressee as its referent.

(54) $\llbracket [\text{person} : 2]_k \rrbracket^{g,c}$ is only defined if $g(k) = \text{addressee}(c)$;
 if defined, $\llbracket [\text{person} : 2]_k \rrbracket^{g,c} = g(k)$ (Zanuttini et al. 2012:1265, ex. 47b)

¹⁷Note also the difference in the spelling of the quantifiers in (52) and (53). There is also a slight prosodic difference between the two sentences. These are both cues that two lexically distinct quantifiers are being used in these constructions. In fact, the English quantifier *everyone* does not readily combine with a partitive phrase at all, and must be substituted by *every one*, which has different syntactic properties. *Everyone* may be possible with a collective interpretation, but is impossible with the distributive interpretation intended by Zanuttini et al. (2012).

- (i) a. ?Everyone of the senators met on Tuesday.
 b. *Everyone of the senators voted yea on the resolution.
- (ii) a. ?Every (single) one of the senators met on Tuesday.
 b. Every (single) one of the senators voted yea on the resolution.

Zanuttini et al. (2012) does not supply a standalone definition for the Jussive head, nor does it give a full derivation of an imperative clause (see §5.2.3 for full discussion of the compositionality of the property analysis). I have created a derivation of the English imperative *Sit down!* (55) based on Zanuttini et al. (2012:ex. 48b), which derives a simple promissive (1st person jussive) sentence. The only significant difference from the original derivation is the change from 1st to 2nd person.

$$\begin{aligned}
 (55) \quad \llbracket \textit{Sit down!} \rrbracket &= \\
 &\llbracket \text{Jussive}^0[\text{person} : 2]_k [\textit{pro}_k[\text{person} : 2] \textit{sit down}] \rrbracket^{g,c} = \\
 &[\lambda x : x = \llbracket [\text{person} : 2]_k \rrbracket^{g,c} . \llbracket \textit{pro}_k[\text{person} : 2] \textit{sit down} \rrbracket^{g[k \rightarrow x],c}] = \\
 &[\lambda x : x = \textit{addressee}(c) . [\lambda w . x \textit{sits down in } w]]
 \end{aligned}$$

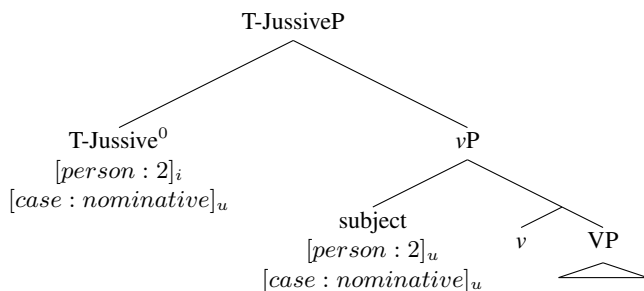
This method derives the property denotation and licenses the *pro* subject in English. Zanuttini (2008) and Zanuttini et al. (2012) both attribute the successful licensing of *pro* to the Agree relationship between it and Jussive^0 , but do not elaborate on the effects that this syntactic relationship has on the semantics or pragmatics. The derivation in (55) sheds some light on this issue. Without the abstraction provided by the Jussive head, *pro* would denote a free variable x . In a non-*pro*-drop language like English, this free variable cannot be assigned a referent pragmatically, i.e. solely appealing to the utterance context. Thus the presence of Jussive^0 really does semantically “rescue” *pro* from causing the derivation to crash (in minimalist terms, at LF). The only open question then is whether the Agree relation between the two is crucial to the interpretation. It seems that the Agree relationship does in fact mandate that the free variable denoted by *pro* corresponds to the lambda-operator introduced by Jussive^0 . For example, the presence of Jussive^0 cannot license object *pro*-drop in English, even if the subject position is filled with a DP that does not require semantic identification.

$$\begin{aligned}
 (56) \quad &\text{There's a man at the door. *You open!} \\
 &(\text{Intended reading: } \textit{You open the door!})
 \end{aligned}$$

The exact mechanics of how Agree corresponds to semantic variable binding are not spelled out in the property analysis, and I will not pursue a further analysis of it here.

To summarize the basic template for deriving properties from imperative clauses, recall the syntactic template for imperatives within the property analysis.

(57) =(13)



A structure of this sort also provides the basic semantic template for imperatives. Properties, in this form, are ready to be picked up by the pragmatic component and assigned to the appropriate To-Do List, as defined by Portner (2004a; 2007).

(58) $[\lambda x : x = \textit{addressee}(c) . [\lambda w . vP(x)(w)]]$
 (Zanuttini et al. 2012:1264, ex. 43b)

The syntactic/semantic interface between (57) and (58), plus the pragmatic function for assigning denotata to discourse components, forms the core of the property analysis. In the next subsection, I raise some issues not fully explained by the analysis and propose some potential refinements.

2.3.4 Possible Revisions for the Property Analysis

One of the major explanatory goals of Portner's (2004a) proposal is to show why declaratives, interrogatives, and imperatives are the three universal clause types. The theory centers around the fact that these clause types represent the (only) three types of semantic objects that can be represented by matrix sentences, and that this interface restriction is a property of Universal Grammar. The discourse components that track each clause type are then represented as sets of matrix sentence denotata, and a single pragmatic update function is responsible for adding these denotata to the appropriate set. While in principle this should allow for a directly parallel treatment of the three major clause types, imperatives are still the odd man out in Portner's (2004a) system. Unlike the Common Ground for tracking declaratives and the Question Set or QUD Stack for tracking interrogatives, which are shared among all discourse participants, To-Do Lists tracking imperatives are specific to individuals.¹⁸ The simplest pragmatic update function — one which is sensitive only to semantic type — cannot handle multiple To-Do Lists. Portner's (2004a) more complex representation of discourse sacrifices full parallelism in the pragmatic component. Below I discuss whether full parallelism can be implemented without sacrificing any of the theory's explanatory power.¹⁹

The first question to address is whether maintaining separate To-Do Lists for each participant in the discourse is strictly necessary. Would tracking imperatives in a single, shared To-Do List not accurately represent the communicative effects of imperatives? In broadly descriptive terms, the reason for maintaining separate To-Do Lists for each participant is to ensure that the norms, duties, or permissions created by imperatives apply only to the individuals being addressed by the speaker of the imperative. For example, if two individuals are standing and one says to the other, *Sit down!*, it should not have the effect that both of them should sit down. Maintaining two separate To-Do Lists is a brute force way of accomplishing this, but given the way that Portner (2007) defines imperatives semantically, the issue should never arise. Recall

¹⁸This discrepancy is carried throughout the literature based on the property analysis. See the beginning of this section for a full list of papers that use Portner (2004a) as a foundation.

¹⁹What I propose in this subsection deals with the distinction between shared vs. individual To-Do Lists. Independently, multiplying or modifying the structure of To-Do Lists may be necessary to represent the different illocutionary forces that can be communicated with imperatives. I am not addressing that issue here, but see §2.3.2 above for further discussion.

that every property denoted by an imperative carries a domain restriction, governed by the person features on Jussive⁰.

$$(59) \quad \llbracket \text{Sit down!} \rrbracket = [\lambda w \lambda x : x = \text{addressee}_C . x \text{ sits down in } w] \quad = (45)$$

The pragmatics specified by Portner (2004a; 2007) takes denotations of exactly the form given in (59) and adds them individual To-Do Lists. For example, if John has no previous duties and the command *Sit down!* is addressed to him, then John's To-Do List should be of the following form:

$$(60) \quad T(\text{John}) = \{[\lambda w \lambda x : x = \text{addressee}_C . x \text{ sits down in } w]\}$$

This cannot be an accurate representation of the property assigned to John's To-Do List, since the domain restriction $x = \text{addressee}_C$ no longer provides any useful information. The referent of the current addressee is constantly changing, and it is usually not possible to recover contextual information of this sort after-the-fact. This is evident in direct quotation of declaratives containing context-sensitive pronouns.

- (61) a. Patrick said, "You seem happy."
 b. Patrick was talking to Veronica this morning. He said, "You seem happy."

With no knowledge of the conversation being reported, it is impossible to arrive at the propositional meaning of Patrick's utterance in (61a). However, information about the context can be overtly supplied, as in (61b). Thus the domain restriction in (60) provides no useful information once its property is placed onto a To-Do List, unless a full contextual history of the conversation is maintained. The domain restriction must be resolved in some way so that the properties on the To-Do List are fully informative.

One way to avoid this problem would be to say that the only purpose of the domain restriction is to provide information to the pragmatic update function, and that it should be discarded once it has been

determined that the property is destined for John's To-Do List. If this were done, John's To-Do List would instead contain an unrestricted property.

$$(62) \quad T(\text{John}) = \{[\lambda w \lambda x . x \text{ sits down in } w]\}$$

This is not a desirable result, as it does not capture the intended meaning of the imperative. The To-Do List given in (62) would have the effect that it is now among John's duties to ensure that everyone sits down. Therefore the domain restriction cannot be discarded outright.

Instead, the domain restriction can be preserved but resolved. This would match the way in which declaratives with context-sensitive pronouns are added to the Common Ground. Consider a conversation-initial declarative utterance such as the following:

(63) Context: Patrick encounters Veronica on the street and sees her smiling.

Patrick: You seem happy.

→ CG = {Veronica seems happy}

→ CG = {*addressee_C* seems happy}

If the context-sensitive expression *addressee_C* is replaced in the same manner in imperatives, then addressing the command *Sit down!* to John will have the following effect:

$$(64) \quad T(\text{John}) = \{[\lambda w \lambda x : x = \text{John} . x \text{ sits down in } w]\}$$

This produces the proper effect — John is now responsible for bringing it about that he sits, and not that anyone else sits — but is redundant. Why separate properties with the domain restriction $x = \text{John}$ into their own list? If all properties denoted by imperatives are similarly specified, they can all coexist in a single, shared To-Do List without losing track of what duties belong to what individual.

A potential reason not to resolve domain restrictions in this way and combine all properties into a single To-Do List would be the fact that properties with resolved domain restrictions no longer appear very semantically distinct from propositions. Given the resolved property assigned to John in (64), a simple step of lambda-conversion produces a saturated proposition.

$$(65) \quad [\lambda w \lambda x : x = \text{John} . x \text{ sits down in } w] = [\lambda w . \text{John sits down in } w]$$

If this step is taken, the imperative can no longer fit into the pragmatic system proposed by Portner (2004a; 2007). If lambda-conversion is done after addition to a To-Do List, then the To-Do List is no longer a list of properties. If lambda-conversion is done before addition to a To-Do List, the pragmatic update function will add it to the Common Ground as if it were an assertion. Theory-internally, resolution of the domain restriction on imperatives is impossible. But if it is such a simple step to recover a proposition from an imperative utterance, why should the theory bar it? Yes, a distinction must be maintained between asserted and commanded propositions. This is exactly the sort of distinction which is created in a theory that treats imperatives as preferring propositions, rather than asserting them. I turn to such a proposal in the next section, and will adopt a preference-based view in the remainder of the dissertation.

2.4 Imperatives as Preferences

2.4.1 Discourse States and Illocutionary Updates

Preference semantics (Starr 2010; 2012) is a dynamic semantic system that unifies, rather than separates, the meanings of different types of clauses. It builds on the framework of Inquisitive Semantics (Groenendijk and Roelofsen 2009), which uses a combined information state containing content which is both informational (assertive) and inquisitive (questioning). Preference semantics extends the representation of an information state by incorporating preferential content. With this addition, preference semantics can

operate on three major types of semantic objects: propositions, alternatives, and preferences. Propositions are conceived in the traditional way, as sets of worlds, spelled out as $\{w_0, w_1, w_2, \dots\}$ or abbreviated with a letter p . A bare proposition cannot exist in an information state, but is instead represented as an alternative, an ordered pair of propositions containing a non-empty proposition and an empty proposition $\langle p, \emptyset \rangle$. Preferences are also ordered pairs of propositions, but unlike alternatives, neither proposition is empty $\langle p, q \rangle$.²⁰ The generation of a new preference of the form $\langle p, \neg p \rangle$ is the canonical contribution of an imperative clause. A pair of propositions of the form $\langle \emptyset, p \rangle$ is said to be *absurd*, as such a structure would indicate that ruling out all possible worlds is preferable to p being true.

A set of preferences can be used to model informational, inquisitive, and preferential content simultaneously within a single semantic object, called a *preference state* R .

(66) *Definition of preference state* (Starr 2012:20)

A preference state R is a binary relation on a set of alternative propositions. It represents the preferences that are being taken for granted for the purposes of the interaction. $R(a, a')$ means that a is preferred to a' . C_R (issues at stake in R) is the set of (non-empty) alternatives related by R . c_R (information at stake in R) is the union of those non-empty alternatives. It is assumed that the agents always prefer their information to absurdity, so $\forall R : R(c_R, \emptyset)$.

Because preference states can contain three types of information, they are richer than a Stalnakerian Common Ground, which only contains propositions. However, just like in the Common Ground model, if the information contained in R corresponds to the mutually assumed information, alternatives, and preferences held by interlocutors, it represents the current state of the discourse. Furthermore, R can be sequentially updated with utterance contents to track the progress of the discourse. Again, these updates are richer than their analog in the Common Ground model, which is just set union. In preference semantics, each clause type specifies an update rule which adds preferences to R and/or modifies the existing prefer-

²⁰ When a preference orders two unrelated propositions $\langle p, q \rangle$, I will refer to it in prose as a “preference for p over q ”, and when a preference orders a proposition over its complement $\langle p, \neg p \rangle$, I will refer to it as a “preference for p ”.

ences in R . (See (68) and (70) below for the complete form of declarative and imperative updates within preference semantics.)

The semantic richness of R and the update functions that modify R allow the entire discourse to be tracked with a single semantic object. Since all members of a preference state are ordered pairs of propositions, no additional information outside of R is required to capture the fact that “declaratives provide information by eliminating worlds ... interrogatives introduce alternatives by grouping those worlds into sets, *imperatives order alternatives*.” (Starr 2012:2, emphasis original). The discourse representations that are segregated in the property analysis — Common Ground, Question Set, and To-Do List — are all unified in a single representation R . However, no information is lost, and the collections of information that correspond to these representations can be read directly from R . The equivalent of the Common Ground is the set of all propositions contained in R 's preferences. The Question Set is modeled by the set of all alternatives in the discourse representation: $\langle p, \emptyset \rangle \in R$. The collected preferences in R of the form $\langle p, \neg p \rangle$ replace To-Do Lists.

There are several axiomatized restrictions on preference states, including that they must have some content ($*R = \emptyset$) and that they cannot contain absurd preferences ($*\langle \emptyset, a \rangle \in R$). When being used to track the state of a discourse, each new utterance updates the preference state by modifying its existing preferences and potentially adding new ones; the semantic effect of applying an update by uttering a sentence φ in a context R is notated $R[\varphi] = R'$.

Sentences in preference semantics are divided into two components: a propositional radical and the force of the sentence.²¹ Starr (2010) defines force operators for each of the three major sentence types, declarative \triangleright , interrogative $?$, and imperative $!$. The semantics of each force operator specifies a series of update rules, which either modify existing preferences within R (e.g. $\langle a, \emptyset \rangle \longrightarrow \langle a \cap p, \emptyset \rangle$) or add new preferences to R . Assertions and questions add preferences of the form $\langle p, \emptyset \rangle$. These objects group

²¹Starr refers to this as the “mood marking” of the sentence (2012:24). I refer to it here as “force” for greater compatibility with my syntactic analysis of imperatives, which argues that the non-propositional contribution of the sentence is associated with the ForceP projection in the clausal left periphery; see §4.2.1 and §5.2 for further discussion. I also want to avoid any confusion with other syntactic positions responsible for morphological mood marking on verbs.

worlds together but prefer them to no worlds; the result is that they are interpreted as alternatives. On the other hand, imperatives introduce preferences of the form $\langle p, \neg p \rangle$, indicating that one group of worlds is preferable to its complement. None of the force operators introduce preferences of the form $\langle p, q \rangle$, where p and q are not complements. Such preferences are permissible within preference structures, but must be introduced by the semantics of special lexical items, such as *prefer* or *rather* in English, or be generated by applying general pragmatic reasoning processes to the contents of R .

The table in (67) lists the types of preferences introduced by the three major force operators. For ease of presentation, these preferences are slightly simplified from their formal definition. Technically, each preference introduced to a discourse state R only relates propositions whose extensions are contained within c_R . For example, what is notated as $\langle p, \emptyset \rangle$ in (67) corresponds to $\langle c_R[p], \emptyset \rangle$ in the definitions from Starr (2012) given below.

(67) *Contributions of force operators*

	Sentence type	Preference added
▷	declarative	$\langle p, \emptyset \rangle$
?	interrogative	
	<i>polar question</i>	$\langle p, \emptyset \rangle, \langle \neg p, \emptyset \rangle$
	<i>Wh-question</i>	$\langle p, \emptyset \rangle, \langle q, \emptyset \rangle, \langle r, \emptyset \rangle, \dots$
!	imperative	$\langle p, \neg p \rangle$

Besides contributing new preferences, each force operator also modifies the existing preferences within R . Because force operators have this additional effect on R , they match Murray's (2010) definition of *illocutionary relation*, a function that takes the discourse context and a proposition, and returns an updated, structured context. For example, simply adding a new preference of the form $\langle p, \emptyset \rangle$ does not capture the effect of assertion. Like assertion in a Common Ground model (e.g. Stalnaker 1979), assertion in preference semantics serves to remove worlds from consideration. This cannot be done by performing a single intersection with c_R , the live worlds, since c_R is not directly represented in R but is computed from its con-

stituent preferences. Eliminating worlds from consideration must be done by individually intersecting the asserted proposition with each proposition contained in the preferences in R . Thus Starr (2012) defines the declarative update as follows:

(68) *Definition of Declarative Update* (Starr 2012:27)

$$R[\triangleright p] = \{\langle a[p], a'[p] \rangle \mid \langle a, a' \rangle \in R : a[p] = \emptyset\} \cup \{\langle c_R[p], \emptyset \rangle\}$$

This performs two distinct transformations on R .

- (69)
1. Take every preference in R and intersect both of its members with p .
 2. “Highlight” the asserted proposition by adding the preference $\langle p, \emptyset \rangle$.

The imperative update is slightly more complex, as it performs three transformations. It does not eliminate any worlds from R , but alters and augments its preferences.

(70) *Definition of Imperative Update* (Starr 2012:26)

$$R[!p] = R \cup \{\langle c_R[p], c_R - c_R[p] \rangle\} \cup \{\langle a[p], a - a[p] \rangle \mid a \in C_R \ \& \ a[p] = \emptyset\}$$

1. Admit all of the preferences in R .
2. Introduce a global preference for all of the p -worlds in c_R over the non- p -worlds.
3. For each alternative a in C_R , if there are p -worlds in a then introduce a local preference for the p -worlds in a over the non- p -worlds in a .

After the update is complete, additional pragmatic reasoning may eliminate worlds from R , but this is not part of the definition of the imperative operator *per se* (see §3.4.1 for an instance of when this type of reasoning applies).

The combination of these three transformations ensures that the propositional content of the imperative becomes mutually preferred for the purposes of the discourse. To demonstrate the workings of the update rule, consider a very simple initial discourse state $R = \{\langle\{w_0, w_1, w_2, w_3\}, \emptyset\rangle\}$. The only information contained in R is that there are four worlds under consideration and that none of them are grouped or ranked with respect to one another. R can then be updated with an imperative utterance such as *Bill, jump!*, whose meaning is $!J$. For the purpose of this example, assume that the extension of $J = \{w_1, w_2, w_3, w_4\}$. The application of the imperative update rule then applies as in (71). Note that the intermediate stages R', R'', R''' do not correspond to stages of the discourse, but are shown to illustrate the effects of the imperative update, which is applied all at once.

(71)	$R: \{\langle\{w_0, w_1, w_2, w_3\}, \emptyset\rangle\}$	<i>initial preference state</i>
	$R': \{\langle\{w_0, w_1, w_2, w_3\}, \emptyset\rangle\}$	<i>admit all preferences in R_0</i>
	$R'': \{\langle\{w_0, w_1, w_2, w_3\}, \emptyset\rangle, \langle\{w_1, w_2, w_3\}, \{w_0\}\rangle\}$	<i>introduce global preference</i>
	$R''' = R''$	<i>no local preferences to introduce</i>
	$R[!J]: \{\langle\{w_0, w_1, w_2, w_3\}, \emptyset\rangle, \langle\{w_1, w_2, w_3\}, \{w_0\}\rangle\}$	<i>updated preference state</i>

2.4.2 Semantic and Syntactic Consequences of Preferences

Applying preference semantics to imperatives captures the best aspects of previous analyses of imperatives, and avoids several of the problems that they face. Because they contain different illocutionary relations, imperatives and declaratives have significantly different effects when applied to a given context, unlike what is predicted by the modal analysis. However, since all clause types denote update functions that apply to preference states, the pragmatic application of clausal meaning can be unified, unlike the mechanism used in the property analysis. I explain the details of how preference semantics provides these benefits throughout the rest of the dissertation; in the remainder of this section, I show how a preference analysis obviates some smaller problems.

Although the definition of imperative update (70) is complex, all of its parts pertain directly to the update and structuring of R . There is no need to place additional constraints on imperative meaning, such as the “presuppositional” restrictions needed in Kaufmann’s (2011) definition of Op_{imp} (11). It is perfectly possible to apply ! to any proposition, including past tense propositions; restrictions on such constructions are left to the morphosyntactic component of the grammar. Other constraints, such as the Epistemic Uncertainty Constraint, can be avoided with a suitably robust definition of discourse relevance, which applies to all utterances. Preference semantics provides a framework that allows for a simple, direct computation of relevance for all clausal utterances (§3.4).

Additionally, a preference analysis eliminates the need to provide an ordering source and the resulting problem of circularity. One disadvantage of preference semantics is that a full account of modals within its dynamic system is still under development; fortunately, it can account for the full range of imperative meaning without one. Where the modal analysis had difficulty with the meaning of two consecutive imperative utterances, preference semantics is developed with this sort of case in mind (Starr 2012:25 ff.). Take the same two imperatives that were considered in §2.2.3 above: *Get up!* and *Get dressed!*, which will be represented as ! U and ! D respectively. Applying ! U and ! D in sequence gives the following results:

$$\begin{aligned}
 (72) \quad R_0 &= \{\langle W, \emptyset \rangle\} \\
 R_1 &= \{\langle W, \emptyset \rangle, \langle U, \neg U \rangle\} \\
 R_2 &= \{\langle W, \emptyset \rangle, \langle U, \neg U \rangle, \langle U \cap D, U \cap \neg D \rangle, \langle \neg U \cap D, \neg U \cap \neg D \rangle, \langle D, \neg D \rangle\}
 \end{aligned}$$

The local preferences in R_2 , $\langle U \cap D, U \cap \neg D \rangle$ and $\langle \neg U \cap D, \neg U \cap \neg D \rangle$, are what allow satisfaction of the commands to occur in either order. For example, if it becomes common knowledge that D is true, the remaining $D \wedge U$ worlds will still be preferable to the remaining $D \wedge \neg U$ worlds. The same holds even if $\neg D$ becomes common knowledge; if there is no entailment relationship between the two propositions, $\neg D \wedge U$ worlds will still outrank $\neg D \wedge \neg U$ worlds.

2.5 Summary

This chapter has provided background on three major approaches to imperative meaning: the modal analysis (Kaufmann 2011), the property analysis (Portner 2004a; 2007), and preference semantics (Starr 2010; 2012). Both the modal analysis and property analysis have flaws, especially with respect to how declarative, interrogative, and imperative meaning interact.

Preference semantics unifies all three types of meaning, and I continue the theme of unification in the preference analysis presented in the remaining chapters. Another benefit of preference semantics is that it manipulates discourse representations, which are always taken to indicate information that is mutually accepted for the purposes of the conversation. In the next chapter, I show how a model of discourse that uses preference states can be used to directly determine the relevance and felicity of any utterance, regardless of clause type. Also, since it is not necessary to maintain multiple discourse components of different types, there is no reason to assume that any one clause type has a syntactic projection that another does not. This will play a major role in my syntactic analysis of imperatives within an articulated left periphery (Chapter 4) and will facilitate a direct mapping between the syntax and semantics (Chapter 5).

CHAPTER 3

MEANING AND BEHAVIOR OF IMPERATIVES IN DISCOURSE

3.1 Introduction

This chapter deals with imperative meaning beyond the level of a single sentence. In particular, it asks what can be learned about imperative meaning through examining the felicity of follow-ups to imperatives and imperative utterances themselves. The effectiveness of follow-up utterances, particularly affirmations and challenges, serves as a diagnostic for what meaning was contributed by the imperative. Similarly, an imperative utterance must be compatible with the current informational state of the discourse to be felicitous.

The chapter is organized as follows. §3.2 introduces the concepts of *at-issue* and *not-at-issue* meaning (characteristics of propositions used in a particular context) and shows which types of meaning imperatives contribute. I argue that imperatives contribute at-issue propositional content as well as illocutionary content, which is neither at-issue nor not-at-issue. §3.3 looks at the felicity of imperative utterances within the framework of Relevance (Roberts 1996; 2004; Simons et al. 2011). Earlier work on Relevance does not have a method for directly computing the relevance of imperatives with respect to the Question Under Discussion, so in §3.4 I propose a method for doing so within preference semantics. Since preference semantics unifies all types of clausal meaning into a single discourse representation, I am able to formulate a single definition of Relevance for all clause types.

3.2 Effects of Imperative Utterances

3.2.1 Introduction to Challenge Tests

This section explores what effect imperative utterances have in discourse, paying special attention to restrictions on what can be felicitously uttered in the immediately following context. The extent of these

restrictions goes far beyond the traditional observation that imperatives can't be challenged in terms of truth or falsity.

(1) A: Take out the trash!

B: #That's true. / #That's false.

(after Iatridou 2008: ex. 43–44)

In §3.2.1 I introduce two classes of challenge tests (direct and indirect), which are diagnostic of *at-issue status*, a characteristic of a proposition in a given discourse context. In principle, any expressed proposition can be diagnosed as either *at-issue* or *not-at-issue* (Simons et al. 2011). The term *at-issue* was first introduced by Potts (2003; 2005), which defined *at-issue entailments* as “‘what is said’, in Grice’s terms” and contrasted them with conventional implicatures. Since the concept of at-issueness follows from Gricean pragmatics and deals in entailments and implicatures, it follows that being at-issue or not-at-issue is a characteristic of propositions. I refer to this characteristic as a proposition’s *at-issue status*, and I maintain that non-propositional semantic objects have no at-issue status; as a result non-propositional units of meaning cannot be targeted by either type of challenge test.

In §3.2.2 and §3.2.3 the challenge tests are applied to both imperative utterances and declarative modals. While imperatives show invariant behavior with respect to these tests, modals can vary depending on whether they are used descriptively or performatively (see §2.2.1). For example, without further context, challenging a declarative modal in the same manner as in (1) is perfectly felicitous, as its default interpretation is descriptive.

(2) A: You must take out the trash.

B: ✓That's true. / ✓That's false.

The results of the challenge tests show that imperatives and declarative modals do not have identical content, nor do they vary solely in the at-issue status of their expressed propositions; a crucial piece of

imperative meaning is neither at-issue nor not-at-issue and is so demonstrated to be non-propositional. I categorize this additional meaning as the illocutionary relation of the imperative clause, a concept which I associate with the establishment of preferences (§3.3). An example of the different types of meaning that will play a role in evaluating imperatives in discourse, as contained in the simple imperative sentence *Jump!*, are listed in (3).

(3) *Jump!*

$p = \text{the addressee jumps}$

$!p = \text{imperative update, preferring that } \text{the addressee jumps}$

$R_1 = R_0[!p] = \text{the discourse context, updated and structured such that worlds in which } \text{the addressee jumps} \text{ are preferred}$

I now turn to tests that diagnose characteristics of propositions. In general, these discourse-based tests can be divided into two groups, *direct* and *indirect challenges* (Roberts et al. 2009; Beaver et al. 2009), which each target a different class of propositional content. I argue that all overtly expressed propositions can be classified as either *at-issue* or *not-at-issue*. At-issue content is the main point of an utterance, and furthers resolution of the discourse topic. Direct challengeability is a positive indicator of at-issueness. Not-at-issue content is additional content within an utterance, including but not limited to presuppositions, evidentials, and implicatures. Indirect challengeability is a hallmark of not-at-issue content. Not all content is challengeable; content with no at-issue status resists challenges of either type. Since at-issue status is a characteristic of propositions, any non-propositional content should fail both types of challenges. In §3.2.2 and §3.2.3 we will see that imperatives contain unchallengeable material, which corresponds to the illocutionary relation of the clause. In the remainder of this subsection, I introduce the various challenge tests and provide examples of how they can be applied to non-modal declarative utterances.

Direct challenges are utterances that affirm or deny the truth or falsity of the previous utterance.¹ They are almost always anaphoric, whether they contain an overt propositional anaphor (e.g. English *that*), or indicate anaphoricity indirectly with a discourse particle such as *yes*, *OK*, or *no*. In fact, simply uttering “yes” or “no” can constitute a full direct challenge, albeit a highly elliptical one. “That’s true” and “that’s false” are often used as direct challenge diagnostics, as they are unambiguous; however, in certain contexts they may seem stilted. I try to use the most natural phrasing as possible, and to disambiguate when necessary by providing further followup. This can be accomplished by repeating affirmed content or explaining the reason for rejecting content.

(4) A: John took out the trash.

B1: Yes. He did take out the trash.

B2: That’s false. He only took out the recycling.

Whatever content is anaphorically targeted by a direct challenge is “susceptible of direct affirmation or denial,” and therefore is at-issue (Beaver et al. 2009). In (4), we can conclude that the proposition *John took out the trash*, as asserted in the initial utterance, is at-issue. This is expected, since the utterance is monoclausal and only encodes a single proposition. In more complex constructions, the test distinguishes the at-issue proposition(s) from other content.

(5) A: Jill, who lost something on the flight, likes to travel by train.

$p = \textit{Jill likes to travel by train}$, $q = \textit{Jill lost something on the flight}$

(after Roberts et al. 2009: ex. 3)

¹I refer to these as “challenges” throughout, despite the fact that they do not necessarily seek to reject content from a previous utterance. While the effects of affirmation and denial are opposite, the conditions for performing either of these actions are identical, and rooted in the at-issue status of the targeted proposition. Since the purpose of these tests is diagnosing the conditions in which they can be felicitously uttered, direct affirmations and denials are a single class of challenges.

B1: No, that's false. Jill hates traveling by train.

effect: p is rejected, q is accepted

B2: No, that's false. #Jill didn't lose anything on the flight.

effect: q cannot be directly rejected

conclusion: p is an at-issue proposition in A, q is not

The application of direct challenge tests to (5) shows that the proposition regarding Jill's travel preferences is at-issue, while the non-restrictive relative clause about the object she lost is not. If the proposition expressed by the relative clause is not true, the interlocutor is not without recourse, but must use a different strategy — an indirect challenge — in order to issue a successful challenge.

Indirect challenges may be used on content that direct challenges fail to target. If the indirect challenge succeeds, it indicates that the targeted proposition is not-at-issue. One of the best-known indirect challenges is the "Hey, wait a minute" test, first proposed in Shanon (1976).² This type of indirect challenge can be used to deny the content of the relative clause from (5) above.

²Unfortunately, the contribution of the phrase "Hey, wait a minute" is much more ambiguous than the propositional anaphors or discourse markers used in direct challenges. When used to signal an indirect challenge, its function is to turn the topic of the discourse to a proposition that otherwise would not be up for discussion. A clear example of this is using "Hey, wait a minute" to make lexically triggered presuppositions available for denial.

- (i) A: Have you stopped beating your wife?
B: Hey, wait a minute, I've never beaten my wife.

However, in other contexts, it can be used to simply express surprise or confusion.

- (ii) A: The meeting this afternoon is at 4:00.
B: Hey, wait a minute, that doesn't seem right. Our meetings are always at 3:00.

The use of "Hey, wait a minute" in (ii) does not constitute an indirect challenge, and therefore indicates nothing about the at-issue status of any proposition. (In fact, the antecedent of *that* in B's utterance is an at-issue proposition.)

(6) A: Jill, who lost something on the flight, likes to travel by train.

p = Jill likes to travel by train, *q* = Jill lost something on the flight

B1: Hey, wait a minute, Jill didn't lose anything on the flight.

effect: *p* is suspended, *q* is rejected

B2: #Hey, wait a minute, Jill doesn't like to travel by train.

effect: *p* and *q* are neither accepted nor rejected

The response B1 in (6) has the intended effect of rejecting the content of the relative clause, the proposition *q*. However, it makes no claim about the truth or falsity of *p*, the at-issue proposition in the A utterance. Evaluation of *p* becomes suspended, and must be taken up later in the discourse. This effect of suspension is what the phrase “Hey, wait a minute” achieves.

Note also that trying to apply an indirect challenge to an at-issue proposition is infelicitous. The reason for this is that the aim of the suspension maneuver is to suspend the current discourse topic in order to replace it with the target of the challenge. Using an indirect challenge on an at-issue proposition either inaccurately assumes what the current discourse topic is, or tries to replace the current discourse topic with itself. Neither is a productive conversational maneuver, accounting for the infelicity of the challenge. Removing the phrase “Hey, wait a minute” from such a challenge, such as B2 in (6) above, leaves a direct challenge to an at-issue proposition, which we saw was felicitous in (5).

3.2.2 Applying Direct Challenge Tests

Recall that imperatives cannot be challenged in terms of truth or falsity. The unsuccessful challenges given in (1) are examples of direct challenges. They contain propositional anaphora, which contributes to their failure for one of two reasons: either there is no suitable antecedent for the propositional anaphor *that*, or

there is an antecedent, but its truth or falsity cannot be determined on the basis of the prior discourse. Since imperatives encode preferences, which are composed out of propositions, there is propositional content within imperatives, and thus a potential antecedent. Enriching the challenges by spelling out this proposition does not improve them in any way; p cannot be said to be true or false immediately following an imperative that commands p .

(7) Context: Speaker A is assigning chore duties to his housemates, who include speaker B.

A: Take out the trash!

$p = \text{the addressee takes out the trash}$

B1: #That's true. I (will) take out the trash.

B2: #That's false. I won't / don't take out the trash.

There are also felicitous, yet seemingly direct, responses to imperatives. Such statements of compliance or refusal to carry out an imperative command can also be diagnosed by providing further followup.

(8) B3: OK, I will (take out the trash).

B4: No, I won't (take out the trash).

B3–B4 are felicitous because they avoid claiming whether p is true or false within the current context. The followups in (7) show that doing so is not possible, which is a sign that there are both p - and $\neg p$ -worlds in the Context Set. The followups in (8) allow for this possibility, and only claim whether speaker B plans to make p true or false in a future context. These plain statements of compliance or refusal are just some of the simplest cases of a broader class of felicitous, qualitative comments about the proposition p (9).

(9) B5: No, that's not what I'm going to do.

B6: No, that's a bad idea.

Note that the claims regarding p in (8), not just their means of introduction, make these followups felicitous. Appending *OK* or *no* to anaphoric challenges does not improve them.³

(10) B7: #OK, that's true. / #OK, that's right.

B8: #No, that's false. / #No, that's wrong.

The effectiveness of these various direct challenge strategies leads to the following conclusions. Propositional anaphors in direct challenges cannot target $!p$, because it is not propositional; they must target p . However, it is indeterminate whether p is true or false. Thus the only statements that can be made about p are qualitative ones, or predictions about its truth or falsity in a future context.⁴

³The second challenge in B8 is lexically ambiguous, and could be interpreted as being a felicitous comment about p if *wrong* is taken to mean 'morally wrong' rather than 'false'. Also note that the inclusion of *true* or *false* in these examples enforces a propositional anaphora reading. VP anaphora is possible, and indeed felicitous:

- (i) B1': OK, I will do that.
B2': No, I won't do that.

⁴There is no general prohibition about asserting p or $\neg p$ immediately after an imperative (or at any stage of a discourse), but the inclusion of *yes*, *OK*, or *no* has an anaphoric effect similar to *that*, and thereby presupposes a prior assertion of p . This subtle difference in phrasing has quite robust effects on felicity.

- (i) A: Do your homework!
B1: ✓I am doing my homework.
B2: #Yes, I am doing my homework.

Now let us consider the felicitous direct challenges to performative declarative modal commands (11).⁵ What is the target of such challenges when they are successful? The A utterance in (11) appears to only encode a single proposition: *it is necessary that the addressee takes out the trash*. The more basic proposition, *the addressee takes out the trash*, cannot be targeted even if we make the unlikely assumption that the modal indicates logical necessity, rather than epistemic or deontic necessity.⁶ As with the imperatives above, we can confirm this by enriching the B responses with additional followup material.

(11) A: You must take out the trash(!)

p = *it is necessary that the addressee takes out the trash*

q = *the addressee takes out the trash*

Context: A is reminding B of his existing, publicly acknowledged chore dut.

B1: That's true. I saw it on the chore chart.

B2: That's false. I don't have to until next week.

Context: A is assigning a new chore duty to B.

B3: That's true. #I (will) take out the trash.

B4: That's false. #I won't / don't take out the trash.

Note that the followup in B2 is felicitous because it remains modally subordinated to the A utterance. Rephrasing it as "I won't until next week" makes the response just as infelicitous as B4. The followups in

⁵It should be noted that Schwager (2006) contends that the challenges in (11) are not felicitous if the modal sentence is being used performatively, i.e. as a command rather than an assertion of existing obligation. There is no question that "Stating a norm is not the same as creating a norm," (Platzack 2007), but it also seems clear that performative declarative modals can do either, while imperatives can only do the latter. Resolving this ambiguity in performative declarative modals is an extremely subtle judgment; it is not apparent that the two uses can be differentiated by prosody, and Schwager provides no other tests for performativity.

⁶This is a fact about natural language (or at least English), not a fact about modal logic. In a simple modal logic, we can write $p = \Box q$, and by doing so imply that p and q are the same sort of object — propositions — despite the fact that it appears that p can be decomposed.

B3–4 demonstrate that the challenge is unsuccessful if it attempts to target the non-modal proposition q . Their infelicity is not dependent on a performative interpretation of A.

The same inability to target the non-modal proposition occurs in unambiguously descriptive modals.

- (12) A: It might be raining.
B: That's true. ?It's raining.

The only potential interpretation of the elaboration B in (12) is that it defeats the implicature introduced by A that it might not be raining. This is notable, since a modal such as A conveys two propositions: the modalized proposition and its prejacent (von Stechow and Gillies 2007:45). B attempts to target the latter, but is not fully successful in doing so.⁷ von Stechow and Gillies (2007:ex. 20 ff.) claim that both propositions are accessible later in the discourse; note the equal felicity of *That's right, it might be* and *That's right, it is raining*. However, these responses do not properly fall under the category of either direct or indirect challenges. Given the distinction between these felicitous followups and the B utterance in (12), I conclude that only the modal proposition is properly at-issue in these cases.

Furthermore, following a modal, propositional anaphora can only target the modal proposition even when providing a qualitative followup, rather than affirming or denying the proposition.

- (13) A: You must take out the trash(!)
B1: I understand that.
B2: I don't like that.

Response B1 in (13) is only sensible on the reading "I understand that I must take out the trash", as compared to "I understand that I take out the trash." On the other hand, B2 is ambiguous between "I don't

⁷As phrased above, B seems slightly awkward; it would be much more natural with contrastive focus (*It is raining*) or a separate marker of contrast such as *in fact*.

like the fact that I have to take out the trash” and “I don’t like taking out the trash”, although the latter is likely a case of VP anaphora rather than propositional anaphora.

The felicity of these same followup utterances is different when uttered in response to an imperative.

- (14) A: Take out the trash!
B1: #I understand that.
B2: I don’t like that.

Since there is no modal proposition expressed in the imperative, the only interpretation of B1 in (14) is #“I understand that I take out the trash”, so the utterance is infelicitous. The ambiguity is similarly removed for B2, which can only mean “I don’t like taking out the trash.” This reaffirms that the non-modal proposition is at-issue in imperatives, while the modal proposition is at-issue in performative declarative modals.

All of the data above, in light of the fact that direct challengeability indicates at-issueness, give a solid picture of what propositions are at-issue in both imperatives and performative declarative modals. The infelicity of the direct challenges to imperatives in (7) demonstrates that it is impossible to challenge the overall contribution of the imperative, $!p$. The felicity of followups that target the proposition p is dependent upon whether they attempt to evaluate the truth or falsity of p based on the prior discourse; followups which do succeed indicate that p itself is at-issue in imperatives. Additionally, the modal proposition encoded in performative declarative modals is the only at-issue proposition in the clause, as it alone can be targeted by anaphoric direct challenges. §3.2.3 will examine whether indirect challenges yield converse results, and whether they can target $!p$.

3.2.3 Applying Indirect Challenge Tests

Recall from §3.2.1 that the success of an indirect challenge indicates that its target is not-at-issue. Applying the “Hey, wait a minute” indirect challenge test to an imperative appears to yield the exact opposite results as direct challenge tests.

(15) Context: Speaker A is assigning chore duties to his housemates, who include speaker B.

A: Take out the trash!

$p = \textit{the addressee takes out the trash}$

B1: #Hey, wait a minute, I won't take out the trash.

B2: Hey, wait a minute, I don't have to take out the trash.

B3: Hey, wait a minute, you don't want me to take out the trash.

However, on closer examination, B2–3 of (15) target neither p nor $!p$, but novel propositions related to p . The result of B1 in (15) is not spurious, but is as expected; an indirect challenge of p itself fails because p is an at-issue proposition.

Constructing indirect challenges to target $!p$ is somewhat more difficult. The resulting followups are considerably more awkward, if not downright infelicitous. As indirect challenges, like direct challenges, are supposed to be diagnostic of a subclass of propositions, this result is unsurprising.

(16) Take out the trash!

$!p = \textit{imperative update, preferring that the addressee takes out the trash}$

B1: #Hey, wait a minute, it is not preferred that I take out the trash.

B2: #Hey, wait a minute, it's not best for me to take out the trash.

B3: #Hey, wait a minute, you didn't impose a preference for me to take out the trash.

When applied to performative declarative modal commands, indirect challenges yield no new insights.

(17) Context: A is assigning a new chore duty to B.

A: You must take out the trash(!)

p = it is necessary that the addressee takes out the trash

B1: #Hey, wait a minute, I won't take out the trash.

B2: #Hey, wait a minute, it's not best for me to take out the trash.

Nevertheless, they do confirm the conclusion drawn from the direct challenge data, namely that there is a single, at-issue proposition encoded in the clause. With no not-at-issue content in the clause, indirect challenges uniformly fail against performative declarative modals.

3.3 Imperatives and Discourse Relevance

In contrast to challenge tests, which examine the felicity of utterances following imperatives, Relevance (Roberts 1996; 2004; Simons et al. 2011) is a felicity condition imposed on all utterances requiring that they contribute to the resolution of the Question Under Discussion (QUD), which encodes the current discourse topic as a set of *potential answers*. Applying Relevance to imperatives will make predictions about when imperative utterances themselves are felicitous. However, most accounts of Relevance provide a method of assessing declaratives and interrogatives, but not imperatives.

Since "Relevance can be characterized in terms of logical relations between the [question under discussion] and the semantic content of a new utterance" (Roberts 2012), it ought to apply broadly and a class of utterances as large as imperatives should not be overlooked. Roberts (2012) continues to say that in

order to apply Relevance consistently to all utterances, “we need a dynamic formal semantic theory,” a requirement which preference semantics satisfies. A simple Common Ground model proves insufficient for several reasons. First, the only semantic objects that can be compared to determine Relevance are propositions. Under the property analysis, no such proposition exists within an imperative (or it has to be created *ad hoc*; see §2.3.4 for further discussion), while under the modal analysis, the proposition contributed by an imperative is modal, perhaps rendering it incompatible with the Question Under Discussion. However, under a preference analysis, the actual effect of the update contributed by an utterance can be compared against the QUD.⁸ This accommodates imperative utterances and additional outcomes of basic pragmatic reasoning (§3.4.2). Thus I show that combining prior views of Relevance with preference semantics provides a simple, unified, accurate model of Relevance for any utterance.

3.3.1 Relevance and the QUD

Much recent work on the semantics of imperatives (e.g. Portner 2004a; 2007; Kaufmann 2011) seeks an explanation of when imperatives can be felicitously uttered. The sorts of restrictions that have been proposed include restrictions on the addressee (Portner 2004a), restrictions imposed by the speaker’s knowledge (Portner 2007:364), and a variety of “presuppositional” constraints including the timeframe of the commanded action and the speaker’s authority (Kaufmann 2011).⁹

On the other hand, work on the structure and mechanisms of discourse (e.g. Roberts 2004; Roberts et al. 2009; Simons et al. 2011) has formalized relevance in terms of an utterance’s relationship to the current Question Under Discussion (QUD), “a semantic question (i.e. a set of alternative propositions) which corresponds to the current discourse topic” (Simons et al. 2011:7). At every stage of a discourse, the interlocutors keep track of the alternatives currently under consideration so they can try to choose among them, resolve the QUD, and increase the amount of shared informational content. Various models for tracking

⁸See §2.4.1 for an introduction to the mechanics of updates within preference semantics.

⁹See §2.3.1 for more on the restrictions imposed in Portner (2004a; 2007) and §2.2.2 for the restrictions imposed in Kaufmann (2011)

the QUD (or multiple QUDs) exist. The most commonly adopted model is the push-down stack of QUDs originally proposed by Roberts (1996). In preference semantics (Starr 2010; 2012), all alternatives are contained within a single preference state, which effectively “flattens” the stack of QUDs.

When evaluating relevance, only the topmost QUD in a stack model or the finest-grained alternatives in a preference state are used. Simons et al. (2011) defines relevance for assertions and questions as follows:

(18) *Relevance for assertions and questions*

- a. An assertion is relevant if it contextually entails a partial or complete answer to the QUD.
- b. A question is relevant if it has an answer which contextually entails a partial or complete answer to the QUD.

(after Simons et al. 2011: ex. 13)

However, Simons et al. (2011) does not address the issue of what makes a command relevant. Roberts (2004) provides a preliminary definition of imperative relevance, but it is not as precise as those in (18).

(19) *Preliminary definition of imperative relevance*

A move *m* is Relevant ... if *m* is ... an imperative whose realization would plausibly help to answer [the QUD]. (Roberts 2004:216)

The issue I seek to address in this section is what form a more robust definition of imperative relevance must take and what benefits it provides to the overall theory of relevance. Cormany (to appear) extends Simons et al.’s (2011) paradigm of relevance (18) with a corresponding definition for commands (20).

- (20) A command is relevant if what it prefers contextually entails a partial or complete answer to the QUD.

Formulating the definition in this way does have several advantages. It allows for the relevance of commands to be determined directly and in the same manner as other utterance types: by comparing a portion of the utterance to the potential answers of the QUD. One implication of the three definitions of relevance in (18) and (20), taken as a paradigm, is that all utterance types have a propositional component.¹⁰ I maintain that this is indeed the case, and that any sentence can be divided into two portions: propositional content, and an illocutionary relation. Following Murray (2010), I define an illocutionary relation as a function that takes the discourse context and a proposition, and returns an updated, structured context. Following the dynamic update rules of Starr (2010), we can characterize the illocutionary relations of the major clause types as follows. The illocutionary relation of declaratives performs set intersection within each alternative in the discourse state. Interrogatives introduce new alternatives, with the effect of partitioning the context. The illocutionary relation of imperatives imposes preferences for propositions over their complements.

3.3.2 Generalizing relevance

Since relevance is determined by comparing a potential answer with a set of alternatives, imperatives can address QUDs, as long as they have the appropriate propositional content. The proposed definition of imperative relevance, repeated in (23), targets this proposition directly; it is the proposition preferred in a command. When structured this way, command relevance fits into the larger paradigm of relevance with Simons et al.'s (2011) definitions of relevance for assertions (21) and questions (22).

(21) An assertion is relevant if it contextually entails a partial or complete answer to the QUD.

(22) A question is relevant if it has an answer which contextually entails a partial or complete answer to the QUD.

¹⁰Note that this is contra Portner (2004a; 2007), which claim that all imperative sentences have the semantic type of properties, $\langle e, st \rangle$.

(23) A command is relevant if what it prefers contextually entails a partial or complete answer to the QUD.

All three definitions are of the same form: a propositional component of the utterance is compared to the propositional potential answers of the QUD. The ways in which the utterance types vary is in their illocutionary relation, which specifies how the propositional content updates and structures the current context.¹¹ Since the definitions of relevance vary solely in terms of illocutionary relation, we can say that the paradigm does not represent three distinct concepts, but three variations of a single, unified concept of relevance.

(24) *Unified Definition of Relevance*

An utterance is relevant if the propositional argument of its illocutionary relation contextually entails a partial or complete answer to the QUD.

In more intuitive terms, an utterance's relevance is determined by its propositional content. Its illocutionary relation may have independent effects on the felicity of the utterance — this is especially true of imperatives — but does not directly affect relevance.

Adopting the unified definition in (24) has several benefits. Foremost, it completes and simplifies the concept of relevance. Minor clause types (such as exclamatives, promissives, and the like) can now be tested for relevance with the same diagnostic as major clause types. Additionally, any further refinements to the criteria for relevance (such as allowing gradeable rather than discrete answers to the QUD) will automatically apply to the relevance of all utterances.

¹¹Note that Simons et al.'s (2011) definition of relevance for assertions treats the entire assertion as a bare proposition. I would reword this definition to indicate that assertions are not bare propositions, but propositions dominated by an assertoric illocutionary relation imposing intersection relations within the discourse state. Positing an illocutionary level above the propositional level for assertions is supported by any language that has distinct morphology or syntax in the left periphery of matrix declarative clauses. See Zanuttini et al. (2012) for a summary of Korean clause typing, which is just one example of this phenomenon.

Another advantage is that the relevance of commands can be determined by comparing only the imperative utterance and the QUD. The only type of semantic object that can be directly compared to a QUD is a proposition (or perhaps another question). The proposed account does this by dividing imperatives into a proposition and a preferential illocutionary relation. The division is semantic, and there is no need to pragmatically reconstruct a proposition for purposes of comparison to the QUD. This is in contrast to the property theory of Portner (2004a; 2007), in which the denotation of the imperative first must be added to a To-Do List — a set of properties assigned to a given participant in the conversation — and then a proposition must be recovered from that list by an independent process. Conversely, a theory that treats imperatives and modal declaratives as semantically identical (e.g. Kaufmann 2011) supposes that they have fundamentally identical illocutionary components. The contrasts in relevance and felicity between imperatives and declaratives must be attributed to outside factors under such an approach. None of these problems arise in a system where illocutionary relation is the sole mediator between propositional content and discourse.

3.3.3 Responding to and with imperatives

Illocutionary and propositional components of imperatives

It has long been observed that certain utterances are infelicitous when immediately following an imperative (Iatridou 2008). For one, they are not truth-evaluable, and resist direct challenges in terms of truth or falsity (Cormany to appear).

(25) A: Take out the trash!

B1: #That's true! I (will) take out the trash.

B2: #That's false! I won't / don't take out the trash.

The failure of propositional anaphora in these cases has led some to argue that imperatives are non-propositional. Cormany (to appear) argues that all clause types do in fact have a propositional component. Furthermore, all clauses must have an illocutionary component to be well-formed. This follows from the general claim in speech act theory, “Propositional acts cannot occur alone; that is, one cannot just refer and predicate without making an assertion or asking a question or performing some other illocutionary act.” (Searle 1969:25).

Illocutionary relations lie at the syntax/semantics interface, and are necessary for a clause to be complete both in form and meaning. Any approach which seeks to explain imperatives (or any other clause type) by paraphrasing them in terms of another clause type, adds or substitutes an illocutionary component when one is already present. The *You will*, *You should*, and *I order you to* reductions discussed in Hamblin (1987), and their formal equivalent in Kaufmann (2011) are transformations of this type (§2.2). Furthermore, in the process of paraphrasing, they modify the propositional content of the sentence, so the paraphrases will not be suitable stand-ins when assessing relevance.

It is not enough to simply segregate the meaning of an imperative utterance into two categories labeled “propositional” and “illocutionary”; when combined, the two must have the effect of an imperative, which is canonically a command. However, as Kaufmann (2011) and many others have pointed out, not all imperatives issue commands. It is for this reason that I represent the illocutionary relation of imperatives as establishing a preference. Imposing a preference relation has the effect of taking the common ground of the current discourse and ranking some of its worlds higher than others without eliminating any. For example, the imperative *Take out the trash!* ranks all world in which its addressee takes out the trash above those where he does not, but in no way precludes the possibility that he does not. The preferential illocutionary relation serves as a function that connects the propositional semantics and the discourse semantics. This connecting behavior is a consequence of the types of arguments taken by illocutionary relations; they are used in a context and scope over a propositional constituent.

Examples of imperative responses

Imperatives are natural responses to certain questions. When diagnosing relevance, it is important to bear in mind that imperatives have a significantly different relationship with the surrounding discourse material than declaratives do. Adopting the preferential approach for imperative relevance allows for a straightforward explanation of these cases.

Although QUDs may be introduced in a variety of ways, I will focus on cases where they are directly introduced by the utterance of an interrogative clause. Even when limited to these cases, there is a wide variety of QUDs that can be introduced, and many of them have felicitous imperative responses that are accounted for by relevance. Take, for example, the following dialogue:

- (26) A: Are you going out for lunch today?
B: Yes, but I don't know where to go.
A: Go to the taco place! They have a special today.

In this brief exchange, two QUDs are raised and both are answered, one with a declarative and one with an imperative. The first QUD is a polar question and has the answers *{A is going out for lunch today, A is not going out for lunch today}*. B then answers this question in the affirmative with the elliptical response "Yes." The remainder of B's utterance introduces a Wh-question as the new QUD, which has several answers of the sort *{B goes to the cafeteria for lunch, B goes to the hot dog stand for lunch, B goes to the taco place for lunch, ...}*. This question is answered by A's imperative, which prefers the answer *B goes to the taco place (for lunch)*. A also explains his reasoning for introducing this new preference.

However, there are many questions that imperatives cannot directly respond to. By their very nature, imperatives prefer propositions that the addressee can make true. A question about a third party only has answers pertaining to that third party, and thus an imperative response is ruled out.

(27) A: Where's Bob? I need to talk to him about our project.

The answers to this question are of the form {*Bob is at his desk, Bob is in the lounge, Bob is at the coffee shop, ...*}. No imperative can prefer any of these options.¹² However, either a question or an assertion can make a relevant contribution. For example, the question *Is he at his desk?* has the answers {*Bob is at his desk, Bob is not at his desk*}. The former is a complete answer to the QUD, while the latter is a partial answer to the QUD. Having a single answer that is also an answer to the QUD suffices to make the question is relevant; it is a felicitous response. Likewise, asserting either of those propositions outright is also a relevant contribution.¹³

Additionally, there is a third type of relevant response, which may or may not be fully subsumed under the definition of relevance for assertions. A fruitful strategy for responding to the QUD in (27) is to use a modal declarative. The type of modality expressed by such a response can even vary, and can be clarified with additional explanation.

(28) A: Where's Bob? I need to talk to him about our project.

B1: He should be at his desk. The boss says he has to be there from 9 to 5.

B2: He should be at his desk. He sets his own schedule, but I know he's almost always there at this time of day.

The connections between imperatives and declarative modals have not gone unnoticed in the literature. Portner (2012) claims that the norms introduced by imperatives can later be used by modals as (a

¹² This is certainly the case if Bob is not a participant in the discourse; imperatives are always addressee-directed. Additionally, given the nature of this QUD, if Bob were present, the QUD itself would be a very odd thing to ask. Even if A asked his question out of an extreme lack of perception — Bob is right there in front of him! — an imperative of the sort *Bob, be right here!* would also be infelicitous because it commands something that is already true in the current context.

¹³ An alternative way to respond to this question with an imperative is to not provide an answer, but to suggest an alternate strategy for finding the answer. For example, B could respond *Ask Mary!* The implication of this response is that Mary knows where Bob is. (A declarative utterance, such as *I don't know, but Mary does*, can have the same effect.) This sort of response involves manipulation of the QUD stack that falls outside the purview of relevance, so I will not address it further here.

portion of) their ordering source, while Kaufmann (2011) goes as far as equating imperatives and modals entirely. I do not draw such a strong tie between imperatives and modals since, as I show in §3.3.1, treating imperatives as preferences is crucial to a definition of relevance that applies equally to all clause types. As I examine various types of QUDs in §3.3.4, I will be primarily concerned with the relevance or irrelevance of imperatives; §3.3.5 will return to the relationship between imperatives and modality, and the variable behavior of imperative responses to modal questions.

3.3.4 Answering different types of QUDs

The definition given in (23) covers cases when imperatives are relevant. However, there are many cases in which an imperative cannot provide a relevant response to a QUD, beyond non-addressee-oriented questions (25). There are factors other than the propositional content of the QUD, including information structural requirements, that affect whether an imperative can felicitously respond to the QUD. In this section, I break questions into syntactic classes to examine how the QUDs that they introduce interact with imperative responses.

Polar questions

The simplest QUD is a polar question. Since polar questions only have two potential answers, a relevant response can only give a complete answer to the question, never a partial one.¹⁴

In the appropriate context, an imperative can felicitously respond to a polar question, in either the affirmative or negative.

¹⁴I am abstracting away from responses that indicate the possibility or likelihood of a potential answer to the QUD. These do not constitute partial answers, since a partial answer must eliminate one or more potential answers. Simons et al. (2011) acknowledges that this is an outstanding issue for the current theory of relevance, which “is overly restrictive and should be weakened at least to allow for discourse moves which merely raise or lower the probability of some answer to the QUD being correct” (2011:8, fn. 3). Presumably whatever the necessary modifications to the theory of relevance are, they apply equally to imperatives.

(29) Context: *A is planning her activities for the day.*

A: Am I going to the store?

B1: Go to the store! We're out of eggs.

B2: Don't go to the store! We have everything we need.

The QUD in (29) has the potential answers $\{A \text{ goes to the store}, A \text{ does not go to the store}\}$. Response B1 prefers the former proposition, and response B2 prefers the latter. Both prefer complete answers to the QUD, and both are relevant.

However, many polar questions have no felicitous imperative responses, even if their potential answers are addressee-oriented and non-past.

(30) A: Will I win the race?

B1: You'll win the race. (Everyone else is slower than you.)

B2: #Win the race! (Everyone else is slower than you.)

The QUD in (29) has the potential answers $\{A \text{ will win the race}, A \text{ will not win the race}\}$. The imperative response in B2 prefers the proposition *A wins the race*, which is not among the potential answers. It is not possible to construct an imperative that prefers either potential answer due to the fact that future tense is marked with a modal construction in English, and imperativizing a modal verb is not possible; **Will win the race!* is ungrammatical. However, other modals such as *should* and *must* can be used in questions that have imperative responses; I address these cases separately in §3.3.5.

Object Wh-questions

Wh-questions are more open-ended than polar questions, and may have an unbounded number of potential answers. This allows imperatives to supply either a complete or partial answer to a question. As shown

in §3.3.3, imperatives can straightforwardly answer object Wh-questions. The example given in (26), repeated in (31) below, provides a complete answer to the QUD.

(31) A: I don't know where to go for lunch.

B: Go to the taco place! They have a special today.

In (31), the QUD is introduced by the subordinate clause “where to go for lunch,” and has the potential answers {*A goes to the cafeteria for lunch, A goes to the hot dog stand for lunch, A goes to the taco place for lunch, ...*}. B's response “Go to the taco place!” prefers *A goes to the taco place for lunch*. Since it prefers one and only one of the potential answers, it is a complete answer to the QUD, and is therefore relevant. It is also possible to have a relevant imperative response that provides a partial answer. The simplest way to do so is with a disjunctive command.

(32) A: I don't know where to go for lunch.

B: Go to the taco place or the hot dog stand! They're both close and cheap.

The response in (32) directly prefers two potential answers over the others, and does not establish any further preference among these two options.¹⁵

A less direct method of providing a partial answer is with a negative imperative.

(33) A: I don't know where to go for lunch.

B: Don't go to the taco place! I got food poisoning last time I ate there.

¹⁵The disjunctive proposition *A goes to the taco place or A goes to the hot dog stand* could be a potential answer to the QUD, although it was deliberately not listed in the representation above, which only included atomic propositional answers. If disjunctive potential answers were included in the QUD, partial answers of the sort given in (32) would be reduced to complete answers. Since it does not affect the determination of relevance (which only requires either a partial or complete answer) and makes a list-based representation of QUDs simpler, I will continue to omit disjunctive answers.

B's response in (33) prefers *A does not go to the taco place for lunch*, and has the effect of removing the proposition *A goes to the taco place for lunch* from the pool of potential answers while leaving all other options; hence it provides a partial answer. Note that in the denotation of the QUD given above, *A does not go to the taco place for lunch* is not among the listed potential answers. This is desirable, since if it were, then B's prohibition in (33) would prefer a complete answer, even though the issue raised by A is not fully resolved.

Subject Wh-questions

The above examples showed that imperatives can easily provide several types of answers, both complete and partial, to object Wh-question QUDs. However, subject Wh-questions resist imperative responses.

(34) *Context: Several housemates have met to discuss chores. B is in charge of assigning responsibilities.*

A: Who takes out the trash (this week)?

B: #Take out the trash!

The QUD introduced by "Who takes out the trash?" has the potential answers {*A takes out the trash, B takes out the trash, C takes out the trash, ...*}. B's response, addressing A, prefers *A takes out the trash*, which is one of the potential answers to the QUD. Thus B's imperative utterance in (34) is relevant, but is still infelicitous. I argue that this is not due to a shortcoming in the definition of relevance, but can be attributed to the fact that imperatives can (and frequently do) have null subjects, which has information-structural consequences.

Information structure plays an important role in determining the potential answers of a given question. Marking a certain constituent in a question with prosodic focus indicates that it is what varies among the potential answers.

(35) Who did Mary see?

(As opposed to who she didn't see.)

(36) Who did Mary SEE?
(As opposed to who she emailed, talked to on the phone, etc.)

(37) Who did MARY see?
(As opposed to who John saw, who Bill saw, etc.)

Any response must foreground the same element as the question it seeks to address. For example, “MARY saw Bill” is an acceptable response to (37), but not (35) or (36), at least in most contexts.¹⁶ This type of focal compatibility is known as *congruence to the QUD* (Roberts 1996), and can be formalized as follows.

(38) Move β is congruent to a question $?a$ iff its focal alternatives $\|\beta\|$ are the Q-alternatives determined by $?a$, i.e. iff $\|\beta\| = Q - alt(a)$. (Roberts 1996:24, ex. 25)

In what sense, then, is the imperative response in (34) incongruent to the QUD? The QUD is a subject Wh-question, and bears no additional focus, so the focal alternatives of the question center around the subject nominal. However, the imperative response has a null subject. As discussed heavily in the literature on *pro-drop*, null elements represent backgrounded information (e.g. Butt and King 1997). Since the subject is backgrounded in this manner, there is a focal clash with the QUD, causing infelicity.

There is a strategy available for foregrounding imperative subjects: the inclusion of a vocative. Portner (2004b) likens the information structural status of vocatives to sentence topics, which are a type of foregrounded information. However, adding a vocative to the response in (34) does not make it fully felicitous.¹⁷

¹⁶Shifting focus within a response can be a deliberate conversational maneuver, for example to introduce a conversational implicature. Since I am largely concerned with relevance, which depends on contextual entailment, I will not address issues of implicature further.

¹⁷The judgments expressed in (39) are intended to represent the acceptability of the imperatives when they are used to establish a new norm. If the matter of who has the duty to take out the trash had been decided prior to A's question, neither imperative response would be felicitous. This is due to the general restriction that imperatives cannot be used to describe previously established norms; see Cormany (to appear) for further discussion.

(39) A: Who takes out the trash (this week)?

B1: #?You, take out the trash!

B2: ?John, take out the trash!

(John ≠ the addressee)

This is not a shortcoming of congruence to the QUD. In the next subsection, which deals with imperative responses to multiple Wh-questions, I will show that a vocative's failure to "rescue" an imperative response to a subject Wh-question is in fact a desirable and direct consequence of congruence.

Multiple Wh-questions

Multiple Wh-questions resist bare imperative responses in a manner similar to subject Wh-questions.

(40) John: So, Bob, you're in charge. Who has what job?

Bob (to John): #?Take out the trash!

In English, multiple Wh-questions require pair-list answers, so the potential responses to the QUD in (40) are of the form {*John takes out the trash, John does the dishes, Bob takes out the trash, Bob does the dishes, ...*}. Bob's response prefers one of these propositions, *John takes out the trash*, yet remains infelicitous. However, unlike in the subject Wh-question case in (34) and (39), adding a vocative significantly improves responses to multiple Wh-questions (41), even when only providing a partial answer (42).

(41) John: So, Bob, you're in charge. Who has what job?

Bob: John, take out the trash! Mary, sweep the floor! I'll do the dishes.

(42) John: So, Bob, you're in charge. Who has what job?

Bob: John, take out the trash! I haven't decided what the rest of us should do.

This is due to the fact that multiple Wh-questions not only require a different type of response in terms of content, but also in terms of information structure. In a pair-list answer, both elements of the pair must be foregrounded. The imperative responses with vocatives successfully foreground both elements (subject and VP), and are both relevant and felicitous. The fact that such responses foreground two elements also accounts for why they are not suited to addressing subject Wh-questions, which seek responses with only a single focus.

Adjunct Wh-questions

The final class of QUDs to be examined is adjunct Wh-questions. Although adjunct Wh-questions may have syntactic differences as compared to argument Wh-questions in a given language, they introduce similar sets of potential answers and have similar congruence conditions. However, some adjunct Wh-questions appear to accept declarative responses asserting a propositional answer, but disallow imperative responses preferring the same answer.

- (43) A: Why does everyone assume that I smell bad?
B1: (It's because) you take out the trash.
B2: #Take out the trash!

Adjunct Wh-questions formed with *why* in English are deceptive in this regard. Since *why* takes the place of a clausal adjunct, it is tempting to say that the answers to the questions in (43) are of the form {*A takes out the trash, someone started a rumor that A smells bad, ...*}. However, this is not the case, as questions with non-clausal adjuncts show. The potential answers to the question *When did Bob eat dinner?* are not {*6:00, 7:00, as soon as he got home, ...*} — clearly not, since these are not propositions. Rather, they are of the form {*Bob ate dinner at 6:00, Bob ate dinner at 7:00, Bob ate dinner as soon as he got home, ...*}.

By the same token, the answers to the QUD introduced in (43) are properly represented as {*everyone assumes A smells bad because A takes out the trash, everyone assumes A smells bad because someone started a rumor that A smells bad, ...*}. Despite the potential for ellipsis indicated in B1, a relevant response must contain propositional content that is a full answer to the QUD, at least underlyingly. The supporting material necessary to meet this requirement cannot be overtly represented in an imperative response, as shown by the ungrammaticality of **It's because take out the trash!*. Trying to move the imperative marking to the matrix clause of the expanded response has an equally nonsensical result: **Be because you take out the trash!* This imperative sentence is ungrammatical because it is not addressee-oriented.

3.3.5 Open issue: Modal QUDs

The previous section discussed the ability of imperatives to provide felicitous and relevant responses to certain syntactic classes of questions. Now I turn to a major semantic area not discussed in detail above, which cuts across the various syntactic classes: modal questions. The type of modality expressed in a question also has effects on the felicity of imperative responses. In general, imperatives are most compatible with bouletic modals (those which pertain to wishes or desires). Certain modals in English, including *should* and *must*, are ambiguous between multiple types of modality, including bouletic and teleological (pertaining to goals and the steps taken to achieve them).¹⁸ These semantic distinctions may be linked to relevance via contextual entailment. I will point out one way in which this could be accomplished, but will leave to future work the development of the modal logic that would formally connect the two.

First, it should be established that the acceptability of imperative responses to modal questions can diverge from that of responses to non-modal questions. In (44), imperative responses to a modal polar question are infelicitous or marginal at best, in contrast to felicitous responses to a non-modal question (see (29) above). The imperative responses in (44) also fare far worse than declarative responses.

¹⁸For further introduction to these and other types of modality, with examples, see chapter 2 of Portner (2009) and von Stechow and Gillies (2007).

- (44) A: Do I have to take out the trash?
 B1: You do (have to take out the trash).
 B2: #?Take out the trash! / #?Do it!¹⁹
 B3: You don't (have to take out the trash).
 B4: #Don't take out the trash! / #Don't do it!

One possible analysis of the infelicitous B2 and B4 responses in (44) is that they do not prefer potential answers to the QUD. The QUD introduced by “Do I have to take out the trash?” has the potential answers {*A has to take out the trash, A does not have to take out the trash*}. B2 prefers *A takes out the trash*, which is not among the potential answers, nor is it incompatible with either answer. Recall that it is syntactically impossible to construct an imperative that prefers a modal proposition (see §3.3.4).

However, there are many cases in which imperatives can be felicitous responses to modal questions, such as the modal Wh-question in (45) below.

- (45) A: Who should I see at the conference?
 B1: See Mary! She always gives fantastic talks.
 B2: Don't see Mike! He does good research, but he mumbles.

If the logic used to rule out the imperative responses in (44) were applied to these cases, it would falsely predict that the responses should be infelicitous. The imperative in B1 prefers a non-modal proposition, *A sees Mary at the conference*, but it is felicitous, despite the fact that the QUD has no non-modal potential answers.

It is at this point that an appeal must be made to different types of modality. The responses in (45)

¹⁹B2 is significantly improved when prefixed by *yes*. This is due to the fact that *yes* is elliptical and stands in for a declarative response. Being a complete answer, it discharges the QUD. The imperative utterance then becomes supplemental information, which does not have a direct relationship to the QUD and is therefore not ruled out on grounds of relevance.

are compatible with a bouletic interpretation of *should* in A's question. The responses pertain to B's wishes, desires, or opinions as to what course of action A should take. It is difficult to interpret *should* as expressing a different type of modality in this circumstance.

On the other hand, if A asks a similar question using *must*, multiple interpretations are available.

(46) A: Who must I see at the conference?

Interpretation: Following your wishes/desires/opinions, who will I necessarily see?

B1: You must see Mary. She always gives fantastic talks.

B2: See Mary! She always gives fantastic talks.

(47) A: Who must I see at the conference?

Interpretation: By virtue of my presence at the conference, who will I necessarily see?

B3: You must see Jane. I know you don't like her, but she's running the registration desk.

B4: #See Jane! I know you don't like her, but she's running the registration desk.

Must is ambiguous between bouletic and teleological interpretations. The acceptability of the imperative response depends upon which interpretation is chosen. The followup material in B's responses represent propositions in the ordering source of the modal, and are indicative of the type of modality expressed. Similarly, in the appropriate context, *should* can also have a teleological interpretation. Imperative responses to teleological *should* are just as bad as those to teleological *must*.

(48) *Context: Mary is sick and consulting a doctor, who has just prescribed some medicine for her.*

Mary: So I have to take these pills for two weeks, right?

Doctor: Yes, that's right.

Mary: Should I start feeling better before the two weeks are up?

Doctor: Yes, you should start feeling better in about three days.

(49) Mary: Should I start feeling better before the two weeks are up?

Doctor: #Yes, start feeling better in about three days!

The definition of relevance makes no reference to modality, let alone different types of modality, so how can it be used to explain these differences? One solution would be to employ the concept of contextual entailment already present in the definition of command relevance.

(50) An utterance is relevant if the propositional argument of its illocutionary relation

contextually entails a partial or complete answer to the QUD. = (23), emphasis added

The felicity of imperative responses to bouletic modal questions would then depend on a contextual entailment link between the preferred, non-modal proposition and a modal potential answer to the QUD. For example, the imperative *See Mary!* only prefers the proposition [*the addressee*] *sees Mary*, but may contextually introduce other propositions, such as [*the speaker*] *wants [the addressee] to see Mary*. The propositional expression of this desire can then entail the bouletic modal proposition [*the addressee*] *should see Mary, according to [the speaker's] wishes*.

Collectively, the data presented in this section indicates a link between the type of modality represented in a QUD and the relevance of imperative responses. The open question is how to establish an entailment relationship between the non-modal propositions preferred by the imperative and modal potential answers. Doing so would allow for the definition of relevance for commands to go unchanged. I hope that cross-linguistic data will shed additional light on this question. For instance, a language with modals that unambiguously indicate a single type of modality could provide even clearer evidence that bouletic and teleological modals behave differently with respect to imperatives.

3.4 Relevance and Preference Semantics

3.4.1 Preferences and QUDs

In §3.3.4 I showed how imperatives are sensitive to the current QUD, and what effect this has on their Relevance and felicity. Now I will explain those effects as a direct consequence of the representations used in preference semantics (§2.4.1). Comparing the contents of the discourse state R and the scope proposition of an imperative $!p$ makes predictions that match the pragmatic data.

The contribution of an imperative is to effect a change on the preference state R , which is representative of the information currently assumed for the purpose of the discourse. R also contains information about the possible directions of future discourse, since it typically contains several alternatives. The alternatives of the form $\langle a, \emptyset \rangle$, taken together, can represent the Questions Under Discussion.²⁰ All utterances, including commands, are sensitive to the QUD (Cormany 2012). The alternatives under consideration determine the utterance's Relevance and, at least in part, its felicity. In the examples below, I show how the preference semantics for commands permits or rules out imperative utterances relative to a specified R . This will lead to a formal, dynamic definition of Relevance for commands, which will be generalized to all clause types in §3.4.2.

Successfully Addressing the QUD

Consider the alternatives (obliquely) introduced by the following utterance:

(51) A: I don't know where to go for lunch today.

²⁰Since R may contain alternatives of coarser or finer grain, the entire set of QUDs is represented in a single object. All of these alternatives should, in theory, be directly accessible. Contrast the push-down QUD stack of Roberts (1996; 2004).

The alternatives correspond to all of the possible propositions describing where A will go to lunch. For the sake of this example, assume that A and his interlocutor know that there are only three possible places that A could get lunch — the cafeteria, the hot dog stand, or the taco place — and that A will get lunch at exactly one place. That is to say, A's utterance introduces the alternatives $\{A \text{ goes to the cafeteria for lunch, } A \text{ goes to the hot dog stand for lunch, } A \text{ goes to the taco place for lunch}\}$, and these alternatives are exhaustive and mutually exclusive. We can represent the preference state after (51) is uttered as follows:

$$(52) \quad R_0 = \{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle\}$$

$c = A \text{ goes to the cafeteria for lunch}$

$h = A \text{ goes to the hot dog stand for lunch}$

$t = A \text{ goes to the taco place for lunch}$

A's interlocutor can then introduce a preference for one of these alternatives, say t , by uttering an imperative. (B can optionally provide a rationale for this preference.)

$$(53) \quad \text{B: Go to the taco place! (They have a special today.)}$$

This imperative performs all three steps of dynamic update described in §2.4.1 above, producing a new preference state R_1 .

$$(54) \quad \begin{array}{l} \text{a. Admit } R_0 \text{ preferences: } \{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle\} \\ \text{b. Add a global preference: } \{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle, \underline{\langle t, \neg t \rangle}\} \\ \text{c. Add local preferences:} \\ \quad \{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle, \langle t, \neg t \rangle, \underline{\langle c \cap t, \emptyset \rangle, \langle h \cap t, \emptyset \rangle, \langle t \cap t, \emptyset \rangle}\} \quad \text{intersect each } a \text{ with } t \\ \text{d. Perform pragmatic reasoning:} \end{array}$$

$\{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle, \langle t, \neg t \rangle, \langle \emptyset, \emptyset \rangle, \langle \emptyset, \emptyset \rangle, \langle t, \emptyset \rangle\}$ alternatives are mutually exclusive
 $\{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle, \langle t, c \cup h \rangle, \langle \emptyset, \emptyset \rangle, \langle \emptyset, \emptyset \rangle, \langle t, \emptyset \rangle\}$ alternatives are exhaustive
 $\{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle, \langle t, c \cup h \rangle\}$ remove null and redundant preferences

Because of the additional information about the relationship between the three alternatives, R_1 differs from R_0 only in the global preference $\langle t, c \cup h \rangle$. This preference contributes new information about one of the alternatives present in R_0 , namely $\langle t, \emptyset \rangle$; we can therefore say that B's imperative utterance successfully addressed the QUD.

Failing to Address the QUD

Since an imperative that contributes new information about an alternative under consideration is Relevant, one that fails to do so should be considered not Relevant, and therefore not felicitous. Consider the same situation as in (52), with $R_0 = \{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle\}$. Suppose that, instead of an imperative preferring $\langle t, \neg t \rangle$, B utters a different imperative:

(55) B: Bring me a sandwich!

This imperative establishes a preference for the proposition b over its complement: $\langle b, \neg b \rangle$. The imperative update rules proceed in the same manner; they are not sensitive to the fact that R_0 does not contain an alternative $\langle b, \emptyset \rangle$.

- (56)
- a. Admit R_0 preferences: $\{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle\}$
 - b. Add a global preference: $\{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle, \langle b, \neg b \rangle\}$
 - c. Add local preferences: $\{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle, \langle b, \neg b \rangle, \langle c \cap b, \emptyset \rangle, \langle h \cap b, \emptyset \rangle, \langle t \cap b, \emptyset \rangle\}$

Since there is no contextually specified relationship between b and any of c, h, t , no further pragmatic reasoning takes place, and $R_1 = \{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle, \langle b, \neg b \rangle, \langle c \cap b, \emptyset \rangle, \langle h \cap b, \emptyset \rangle, \langle t \cap b, \emptyset \rangle\}$. Thus this update contributes more information to R than the successful update in (54) above — four new preferences as compared to one — but none of these new preferences provide new information about the alternatives present in R_0 . Put differently, the new information does not contain any preference that would help A decide where he should go to lunch. Thus we can say that B’s utterance in (55) is not Relevant, and therefore not felicitous.

3.4.2 Unifying Relevance Under Preferences

In the above examples, Relevance was determined by whether an imperative update contributed new information about an alternative under consideration. Since the dynamic preference semantics permits direct comparison of imperative, interrogative, and declarative content, this method for determining relevance can be extended to all clause types. To do so, the criteria for relevance can be stated in terms of the content of R prior to and after update with a given utterance. Since preference states are sets, the effected contribution of an utterance to a given state can be computed by set subtraction: $R[U] - R$. Examining context changes of this sort will form the basis for a unified definition of Relevance in a dynamic semantic system.

Preference semantics has representations for all utterance types, and freely mixes them within preference states. To have an effect on a context, alternatives and preferences must be contributed by update rules, which represent illocutionary relations. The three major clause types and their characteristic effects in dynamic preference semantics can be summarized as follows (see also §2.4.1).

- (57)
- a. Assertions use a singleton alternative to filter possible worlds: $\langle p, \emptyset \rangle$
 - b. Questions introduce multiple alternatives: $\{\langle p, \emptyset \rangle, \langle q, \emptyset \rangle, \dots\}$
 - c. Imperatives prefer a proposition over its complement: $\langle p, \neg p \rangle$

The formal similarity between all three clause types is that their contribution is based on a preference which is of the form $\langle p, x \rangle$. Since all of the representations in (57) are generated by illocutionary operators that scope over a propositional constituent, we can say that it is characteristic of these operators that they place their scope proposition as the first element of a preference. This formal similarity can be exploited to create a definition of Relevance not just for imperative utterances, but for all matrix clause utterances.

A unified definition of relevance should apply to the common character of different types of utterances: the first member of the preferences that they introduce. Thus I propose that to be Relevant, an utterance must satisfy two criteria:

- (58) a. The utterance must introduce a preference whose first element entails an element of one of the alternatives under consideration.
- b. The utterance must alter the preference state R .

(58a) is the core of what it means to be relevant. (58b) ensures that Relevant utterances must not only be compatible with R , but provide new information; i.e. re-assertion, re-statement of the QUD, and re-iteration of commands are not Relevant contributions.

Both of these criteria can be captured by examining the change between the preference state prior to and following the utterance. In the definition below, the notation $R[U]$ is to be read “the preference state R updated with utterance U ”.

(59) *Relevance in Preference Semantics*

An utterance U is Relevant iff

$$\exists \langle p, x \rangle \in R[U] - R : p \subseteq a \ \& \ (\langle a, a' \rangle \in R \vee \langle a', a \rangle \in R)$$

Note that this is the actual context change brought about by U , not an abstract context change potential.

Existentially quantifying over $R[U] - R$ also enforces (58b), since if the utterance effects no change on the context, $R[U] - R = \emptyset$ and the quantificational restriction will necessarily be false, deeming the utterance not Relevant.

The definition in (59) can be used to predict the Relevance facts for (53) and (55); these results are summarized below.

(60) A: I don't know where to go for lunch today.

B1: Go to the taco place!

B2: #Bring me a sandwich!

(61) *Computation of Relevance for Go to the taco place!*

$$R = \{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle\}$$

$$R[U] = \{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle, \langle t, c \cup h \rangle\}$$

$$R[U] - R = \{\langle t, c \cup h \rangle\}$$

$t \subseteq t \ \& \ \langle t, \emptyset \rangle \in R$, therefore Relevant.

(62) *Computation of Relevance for Bring me a sandwich!*

$$R = \{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle\}$$

$$R[U] = \{\langle c, \emptyset \rangle, \langle h, \emptyset \rangle, \langle t, \emptyset \rangle, \langle b, \neg b \rangle\}$$

$$R[U] - R = \{\langle b, \neg b \rangle\}$$

$b \not\subseteq c, b \not\subseteq h, b \not\subseteq t$, therefore not Relevant.

An interesting property of Relevance as defined in (59) is that it can be combined with the Cooperative Principle (Grice 1989). This can lead to an acceptable interpretation of (62), even if it is strictly speaking not Relevant. If A assumes that B's utterance must be a cooperative attempt at communication, A will try to infer a reason why b does in fact entail one of c, h, t . One such scenario would be that A and B both

know that the cafeteria is the only place that sells sandwiches. Through this additional pragmatic reasoning, A could conclude that B was indirectly establishing a preference for *c*. The mechanics of this reasoning lie outside of dynamic semantics, illocutionary update rules, and the computation of Relevance, but are nevertheless important factors in the rational behavior of discourse participants. There are also utterances which have no place in the discourse, even when taking additional reasoning into account. For example, if B uttered *Stand on your head!*, its contribution would likely have no inferable tie to any of the alternatives under consideration, and it would be ruled both not Relevant and not felicitous.

3.5 Summary

This chapter has demonstrated two major points about implementing preference semantics for imperatives in discourse. First, the challenge tests presented in §3.2 show that imperatives contribute the type of meaning predicted by preference semantics, since they have an accessible, at-issue propositional component and additional illocutionary meaning. Moreover, their contributions are divergent from those of performative declarative modals. Second, it is possible to account for the felicity of imperative utterances using standard pragmatic tools, including Relevance. The felicity of an imperative utterance depends on its propositional content, its information structure, and the Question Under Discussion. Finally, I formulated a formal definition of Relevance within preference semantics. Because preference semantics unifies all types of meaning within a single discourse representation, I unified the definition of Relevance so it applies to all clause types, without sacrificing its explanatory coverage.

CHAPTER 4

ENCODING THE IMPERATIVE ILLOCUTIONARY RELATION

4.1 Introduction

This chapter explores the ways in which the imperative illocutionary relation can be represented syntactically. As explained in Chapter 3, illocutionary relations require access to both a propositional argument and the discourse context. As such, the natural place for them to reside is in the left periphery, above the constituent that denotes a saturated proposition (likely TP or FinP). However, there are several other functions that must be performed in the left periphery of any clause, and they have significant interactions with the marking of imperativity. Furthermore, the inventory of functional heads in any given language has serious implications for the syntax of imperatives. I aim to show that the range of variation found in imperatives can be accounted for with a single framework of an articulated left periphery. Within this framework, individual languages may encode features on a greater or smaller number of functional heads. I argue in §4.2 that English collapses three clausal features onto a single complementizer head and realizes two other features independently.

The chapter is organized as follows. §4.2 covers previous proposals for the structure of the left periphery, including general proposals and those specifically tailored to imperatives. I adopt an extended version of Rizzi's (1997) structure as a universal template; I then derive a more restricted structure from it, which applies to English. §4.3 looks at the possibilities for information-structural movement in imperatives. I present novel English data that shows a difference between contrastive and non-contrastive topicalization in imperatives, and I use several word order tests to determine the positions of dislocated elements, overt subjects, and *do*-support in negative imperatives. §4.4 applies the same structural account to embedded imperatives, which are present in English and other languages. I show that embedded imperatives are neither weak nor strong islands, but do restrict extraction in ways predicted by their clausal structure.

4.2 The Illocutionary Function of ForceP

4.2.1 Illocutionary Relation in the CP Field

Most accounts of the syntax of imperatives use a left-peripheral projection to explain some or all of their characteristic properties, including verb position, clitic position, and subject agreement. The element responsible for these effects can be treated either as an operator (e.g. Han 2000) or a head (e.g. Zanuttini 2008; Zanuttini et al. 2012). However, past accounts typically rely on either a unitary CP (1) or *ad hoc* projections (2) that are peculiar to imperatives. Such structures leave little room for complex interactions in the clausal periphery.

- (1) *Unitary CP*
CP > TP ... (e.g. Han 2000)
- (2) *Clause-specific phrase*
JussiveP ≥ TP ... (Zanuttini 2008; Zanuttini et al. 2012)

The framework I adopt is an extension of the articulated left periphery as originally proposed in Rizzi (1997). The concepts that Rizzi explained by proposing an articulated CP field are universal properties of clauses, but do not form an exhaustive list. Rather than adopting a fully cartographic approach, I only propose the addition of one more left-peripheral layer. All of the clausal functions are represented by syntactic features, which, depending on the language, may have a dedicated single-purpose head or may reside on a more complex complementizer. The combinations of features present in the lexical inventory of a given language affects the structure and dynamics of its left periphery, in imperatives as well as other clause types.

Han (2000) uses the paucity of positions in the unitary CP model to explain interactions with negation, claiming that scope effects arise due to the order of adjunction in Neg-to-C head raising. I argue

that this analysis is too simple, even when just accounting for negation and no other left-peripheral functions (§4.3.3). Also, labeling the imperative-marking projection as CP delimits the clause, precluding additional peripheral positions. While a clause-specific projection allows higher projections, placing them above the clause-marking position generates anomalous results, both syntactically (§4.2.2) and semantically (§5.2.3).

Zanuttini et al. (2012) posit an imperative-specific projection, JussiveP,¹ to account for the binding of 2nd person anaphors and reflexives in imperatives, even in the presence of a grammatically 3rd person subject.

- (3) a. Everyone wash yourself!
b. *Everyone washed yourself. (after Zanuttini et al. 2012: ex. 12–13)

Zanuttini et al. (2012) argues that the person features of the reflexive *yourself* are not logophorically determined but must be propagated from Jussive⁰ via Agree. These person features are also responsible for licensing *pro* subjects in imperatives, even in languages that typically disallow *pro*-drop in other clause types. In order to establish an adjacency interaction with the presence or absence of a person feature in T⁰, JussiveP is placed directly above TP. Zanuttini et al. (2012) claim that if the person features of T⁰ are compatible with those of Jussive⁰, the two heads will fuse and act as a single probe; otherwise they remain distinct. Thus the projection responsible for imperative properties either immediately precedes or is identical to the projection that bears tense.

Neither Han (2000) nor Zanuttini et al. (2012) places the imperative-marking content within an articulated CP field, although Zanuttini et al. (2012) claim that an additional C layer (equivalent to SubP, which I adopt in (6) below) may exist above JussiveP in embedded contexts (see §4.4.1). This makes both approaches incompatible with a model that adopts an articulated CP.

¹See §2.3.3 for additional discussion of this structure.

(4) *Articulated CP*

ForceP > TopP > FocusP > TopP > FinP > TP ... (Rizzi 1997)

The structure in (4) is by no means universal, and has been revised many times in the literature on the cartography of the left periphery, including in Rizzi (2004). Extensions of the sort that posit extremely fine-grained or language-specific positions (e.g. Cinque's (1999) account of adverb order) do not pertain to the clausal positions that I examine in this chapter. I focus on universal clausal characteristics, including clause type (in ForceP), information structure (in TopP and FocusP), and subject licensing (in FinP). While clause type must be represented quite high in the clause, I do not argue that it must be at the extreme left edge. That position is reserved for an important syntactic (and semantic) characteristic: whether the clause is a matrix or subordinate clause. A dedicated phrase for this function has been proposed for Modern Greek (Roussou 2000) and Korean (Zanuttini et al. 2012), where overt particles occupy a position above the traditional C or Force head. I refer to this projection as Subordination Phrase (SubP) and the feature it encodes as [\pm Sub], although it ought to be present in both matrix and subordinate clauses. The addition of SubP yields the overall clausal architecture (5) that I adopt for the remainder of the dissertation.

(5) *Extended articulated CP*

SubP > ForceP > TopP > FocusP > TopP > FinP > TP ...

However, from a typological standpoint, languages that have an overt functional head that marks only the [\pm Sub] feature are rare. This is likely due to interaction with its immediate neighbor, ForceP, which encodes illocutionary relation / clause type as a non-binary feature [$\text{Force}\{\text{DEC}, \text{INT}, \text{IMP}, \dots\}$]. In most languages, there are two possibilities for the value of [Sub] and three for [Force]. If encoded separately, five functional heads can produce all of the possible combinations of the two features. However, if the two positions are conflated, such that both features must be encoded on a single head, the complexity is not much greater, requiring six heads: [+Sub, DEC], [+Sub, INT], [+Sub, IMP], [-Sub, DEC], [-Sub, INT], [-Sub, IMP].

Furthermore, arriving at this combined system seems highly likely from the point of view of frequency. While having an overt Sub⁰ in subordinate clauses is extremely useful for marking the clause boundary, it will appear with the same form and position in every matrix clause. Highly predictable information tends to be phonologically reduced. One can imagine that matrix clauses are frequent enough that the [-Sub] particle will be phonologically reduced to zero in quick order. Syntactic conflation of the null-headed SubP and ForceP will then produce a combined Sub/Force⁰. Drastic reduction of these systems lead to the simplified left peripheries of languages such as English, which does not overtly mark either Sub or Force in matrix clauses, and combines them in subordinating complementizers. For example, matrix declaratives in English are always headed by \emptyset , while subordinate declaratives can be headed by *that* or \emptyset . See §4.2.2 for discussion of the full English complementizer inventory.

In English, not all of the positions in (5) are realized. Haegeman (2004) presents arguments that there is only a single TopP in English, contra both Rizzi (1997) and Rizzi (2004), which expands the structure in (4) to allow arbitrarily many Topic projections. Building on Haegeman's arguments, I propose that English conflates the adjacent positions of SubP, ForceP, and TopP. The resulting projection is headed by a portmanteau complementizer that carries three features: $[\pm\text{Sub}, \text{Force}\{\text{DEC}/\text{INT}/\text{IMP}\}, \pm\text{Top}]$. The English left periphery therefore has three layers: complementizer, Focus, and Finiteness.

(6) *Extended articulated CP for English*

Sub / Force / TopP > FocusP > FinP > TP ... (following Haegeman 2004)

The greatest effect of the structure in (6) is that Focus has an independent position, while Top is covariant with Sub and Force. This directly predicts interactions between clause type and information-structural movement which are not easily captured in the other theories of imperative syntax. Before addressing these interactions in §4.3, I will address a more basic issue: the syntactic requirements of Force⁰ taken in isolation.

4.2.2 Clause typing methods

The type of contribution that a clause makes is one of its most important characteristics, and the CP domain is responsible in whole or in part for encoding this information. The original motivation for positing a Force projection was to specify clause type.

Complementizers express the fact that a sentence is a question, a declarative, an exclamative, a relative, a comparative, an adverbial of a certain kind, etc., and can be selected as such by a higher selector. This information is sometimes called the clausal Type (Cheng 1991), or the specification of Force (Chomsky 1995). (Rizzi 1997:283)

Specifying ForceP as the locus of clause typing makes a specific syntactic claim about the broader Clause Typing Hypothesis, as introduced by Cheng (1991).

(7) *Clause Typing Hypothesis*

All clauses contain an element that scopes over a propositional constituent (TP) and specifies its discourse function. (Cheng 1991)

I have made the further claim that the semantic effects of “specify[ing] a discourse function” are best represented by illocutionary relations, functions which take a proposition and a context, and return an updated, structured context (§3.3). In order to have access to both of these arguments, the element encoding illocutionary relation must scope over TP and must be high enough to be “outward-facing”; ForceP satisfies these positional requirements.

The next question is whether illocutionary relation is marked on Force⁰ or on an operator residing in Spec ForceP. For a variety of reasons, I argue for the former. For one, ForceP is responsible for enforcing declarative, interrogative, or imperative inflection of the verb. It cannot be the reverse — that an inflected verb determines clause type — as that would require a strictly local relation between the verb and Force,

but in many languages the verb does not raise to C, even in interrogatives and imperatives. Furthermore, information structural positions intervene between Force and the propositional domain. Thus the establishment of a long-distance relationship between Force and the verb is necessary. I take this relationship to be Agree, and following traditional assumptions about the syntactic status of probes and goals (Chomsky 1995), Force must be encoded in the head of its projection. I represent this as a non-binary feature: [Force{DEC, INT, IMP, ... }].

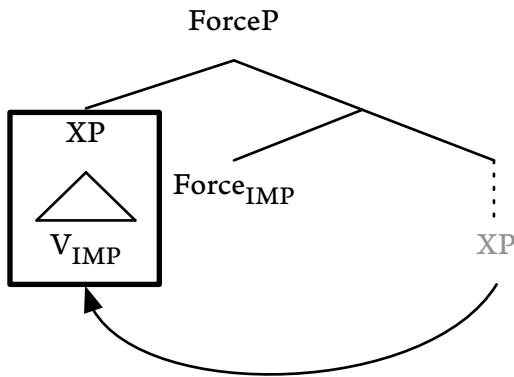
Taking the primary syntactic requirement of clause typing to be the establishment of an agreement relationship, instigated by a Force probe, there are still three possible syntactic methods of clause typing. Agree between Force and a lower category can either drive phrasal movement, head movement, or no movement. Previous accounts have argued that Agree without movement is not sufficient to type a clause, and either phrasal movement (Koopman 2007) or head movement (Han 2000) is required. Below I show that mandating either type of movement generates ungrammatical word orders in English imperatives with fronted elements. As a result, I argue for the theoretically simplest conclusion: only Agree is universally required for clause typing, and additional movement effects may be possible in certain languages.²

Phrasal movement to Spec ForceP (Koopman 2007)

In analyzing Dutch imperative constructions, Koopman (2007) argues for a method of clause typing that involves phrasal movement. In this model, the imperative Force⁰ probes for a maximal category containing the imperative verb; this phrase, which is typically a remnant constituent, is then overtly moved to Spec ForceP. The general schema for this method of clause typing (8) is said to be “part of the native speakers’ ‘knowledge’ of Dutch imperatives” (Koopman 2007:172).

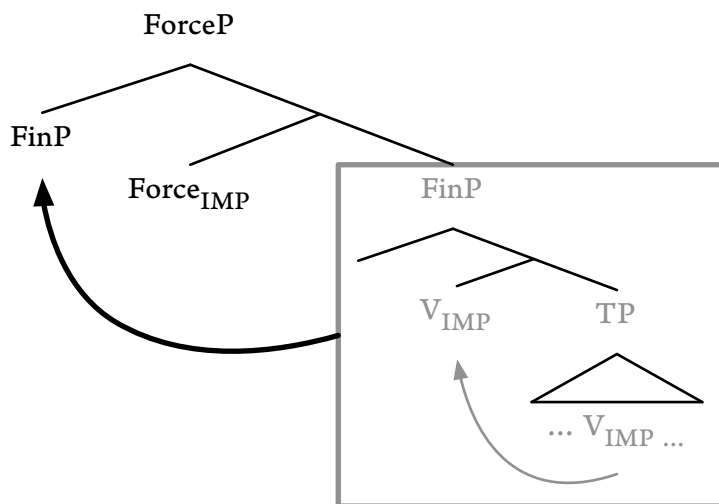
²This claim carries over to other clause types as well. Phrasal movement to Spec ForceP generates V2 orders in declaratives and Wh-movement in interrogatives. Head movement to Force⁰ generates V-T inversion in interrogatives. There is no question that these phenomena are directly linked to clause type, and are frequently linked to matrix vs. subordinate status.

(8) *General clause-typing configuration* (after Koopman 2007:ex. 57)

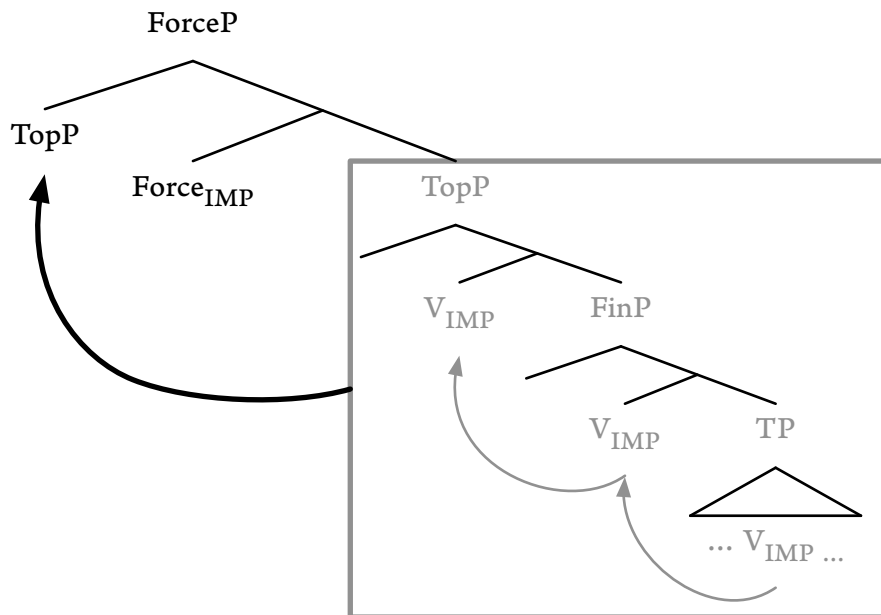


Because of the possibility of an independent TopP in Dutch imperatives (contrast the structure given in (6) for English imperatives), there are two distinct instantiations of the general mechanism given in (8). In the absence of topicalization, TopP is not projected, and FinP headed by the imperative verb is the target of clause-typing movement (9). If topicalization does occur, TopP is projected, the verb must adjoin to Top⁰ to “identify” TopP as imperative, and then TopP moves to type the clause (10).

(9) *Phrasal clause-typing with V-to-Fin* (after Koopman 2007:ex. 58)

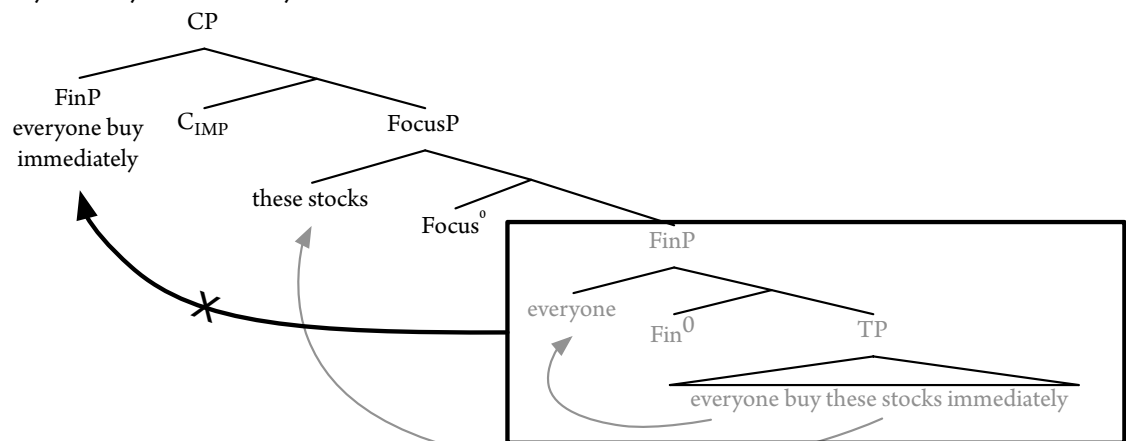


(10) *Phrasal clause-typing with V-to-Fin-to-Top* (after Koopman 2007:ex. 59)



However, both of these configurations generate ungrammatical orders in English. In an English imperative with a fronted constituent,³ targeting FinP results in Subject-Verb-Adverb-Topic order.

(11) *Everyone buy immediately THESE STOCKS!



³(11) uses a contrastive topic fronted to FocusP; see §4.3.1 for discussion of the positions involved in this type of movement.

Even following the additional stipulation of Koopman (2007) that the imperative verb must raise by head movement to the highest head below Force⁰, phrasal movement generates an ungrammatical order: **Everyone immediately these stocks buy!*

Given these results, the phrasal movement method of clause typing is inadequate for English, and therefore inadequate as a universal model. The incorrect predictions of Koopman's (2007) approach are not due only to remnant movement or phrasal movement, but also the prerequisite head movement of the imperative verb.

Head movement of V to C (Han 2000)

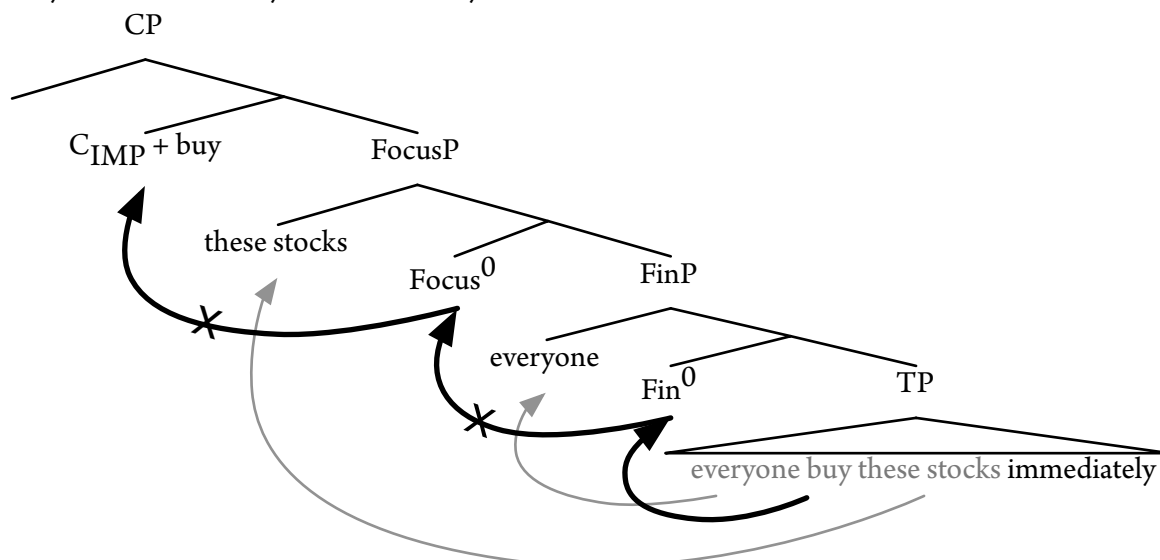
I now will show that a clause-typing method that exclusively uses overt head movement also fails to generate the proper word orders for English imperatives. The argument for imperative verbs raising into the CP field presented by Han (2000) is dependent upon the assumption that there is a unitary CP, headed by an operator C⁰. Furthermore, this analysis takes adjunction, driven by head movement, to be the mechanism for transferring features between heads: "...when the imperative verb adjoins to C⁰, it inherits all of the features of the imperative operator in C⁰." (2000:47). As a result, V always raises to C in imperatives. The position of clitics relative to the imperative verb makes a strong case for overt V to C movement in languages such as Spanish and Italian. However, there cannot be overt V to C movement in English imperatives, as it would generate ungrammatical word orders such as the imperative verb preceding the subject.

- (12) a. Everyone buy these stocks!
b. *Buy everyone these stocks!

In order to enforce the grammatical order in (12a), either the imperative verb must remain low, or imperative C⁰ must also attract the subject to its Spec. While the latter option is plausible in a unitary CP, it becomes untenable in an articulated CP, such as the one posited for English in (6) above. In an articulated

CP, subject licensing is performed below the imperative head; thus the imperative verb must remain low.

(13) *Buy these stocks everyone immediately!



Just because the imperative verb does not raise into C does not mean that it cannot have features valued by C^0 , which are then manifest in the verbal morphology. Below I argue that this relationship is established via Agree, rather than by covert movement as in Han (2000).

Clause typing *in situ*

Rather than enforcing a movement relationship between a head or maximal projection and Force^0 , I attribute clause-typing effects exclusively to the featural content of Force^0 . In many cases, the [Force] feature will probe and Agree with the verb; alone this will trigger morphological marking on the verb, and any movement should be attributed to independent syntactic processes. In fact, even this Agree relationship may be optional, leading to “underinflected” or “uninflected” main verbs in negative imperatives in certain languages (see §4.3.3 for further discussion).

Consequently, clause typing in English is entirely tied to the lexical inventory of complementizers. For

matrix clauses, C^0 is always null, whereas for embedded clauses it may be overt or null depending on clause type (14).

(14) *English complementizer inventory*

	[-Sub]	[+Sub]
declarative	∅	that, ∅
interrogative	∅	if, whether
imperative	∅	∅

Since there is an effect of clause type on verbal inflection in English imperatives, requiring the “bare” form of the verb, I maintain that there is at least an Agree relationship between C^0 and V^0 in English clause typing. This holds in both positive imperatives (15) and negative imperatives (16).

- (15) a. You are happy.
 b. Be happy!
 c. *Are happy!

- (16) a. You are not sad.
 b. Don't be sad!
 c. *Are not sad!

Additionally, English clause typing is tied to the information-structural properties of the clause, since the $[\pm\text{Topic}]$ feature must also be encoded on C^0 . The next section explores this interaction and the independent variation of $[\pm\text{Focus}]$; these two features correspond to non-contrastive and contrastive topicalization, respectively.

4.3 Information Structure in Imperatives

English imperatives have different information-structural restrictions than declaratives and questions. In this section, I show that these restrictions are largely syntactic. There is no semantic restriction on certain information-structural features being present within a single clause, but they must be represented in the available syntactic positions. In English, these positions are determined by the three-layer extended articulated CP (6). The positions in the left periphery account for semantic, pragmatic, and information-structural functions, but are not completely in free variation because, in most languages, they are not isolated in individual syntactic projections.

4.3.1 Contrastive and Non-Contrastive Topics

There are three information-structural processes in English that increase the prominence of a constituent: focalization, contrastive topicalization, and non-contrastive topicalization. Of these, only the topicalization processes always involve overt movement; focalization is typically performed *in situ* and marked only by prosodic stress.

In the absence of a word order diagnostic between contrastive and non-contrastive topics (as is the case in English), the status of a fronted constituent must be determined by semantic and pragmatic criteria. A non-contrastive topic draws attention to its content but does not invoke a comparison to alternatives that might fill that element's role. There is no consensus term for the effect that non-contrastive topicalization has — focus-presupposition, theme-rheme, background-foreground, topic-comment, and given-new are examples (Ward 1988:61) — but they all refer to an intrasentential division between the topicalized element and the remainder of the clause. For example, in (17), the patienthood of the book is given more prominence than the fact that buying was the action that took place or that John was the agent of that action.

(17) The book, John bought ____.

Non-contrastive topicalization does not make extrasentential comparisons by introducing a class of alternative elements that could fill the topic's role in the clause. Contrastive topics do introduce such classes, which can be represented either as an *open proposition*, i.e. a proposition with an unbound variable in place of the topicalized element (Ward 1988), or as *focal alternatives*, a set of propositions with instantiated values for the variable element (e.g. Rooth 1985; Roberts 1996). The existence of alternatives can be represented lexically, as with *these* in (18), or can be pragmatically introduced by the context.

(18) These stocks, the broker bought ___ immediately.

This additional semantic contribution of contrastive topics is mirrored in the syntax; I argue that contrastive topics move to Spec FocusP in English. Doing so unifies the semantic contribution of Focus⁰ for both information-structural and Wh-movement: it is the element that transforms a proposition into an open proposition.

Furthermore, FocusP is an independent position in English. Recall the extended articulated CP for English, which contains three distinct layers.

(19) Sub / Force / TopP > FocusP > FinP > TP ... = (6)

The locus of non-contrastive topics is combined with subordination and clause typing in C⁰. As a result, the value of the [Top] feature covaries with the [Sub] and [Force] features, while the value of [Focus] can vary freely. A major consequence of the bundling of features in C⁰ is the unavailability of non-contrastive topics in imperative clauses.

(20) *The book, buy ___!

(21) These stocks, buy ___ immediately! (Those avoid at all costs!)

I contend that the ungrammaticality of (20) is due to the unavailability of the proper combination of features on C^0 , as determined the lexical inventory of complementizers in English. There is no independent semantic reason for ruling out topicalization within an imperative, and non-contrastive topics do freely appear in other languages, such as Korean.

- (22) Chayk un ilke-ra!
 book TOP read-IMP
 “Books, read!”

The availability of non-contrastive topicalization in Korean is in part due to its more finely articulated CP. Examples of embedding in Korean indicate that it has a morphologically distinct SubP.

- (23) Emma-ka Inho-eykey kongpuha-la-ko hasiess-ta.
 mother-NOM Inho-DAT study-IMP-COMP said-DEC
 “Mother told Inho to study.” (Zanuttini et al. 2012:ex. 50a)

In (22), *un* is the overt head of TopP. Thus the [Sub], [Force], and [Top] features are syntactically independent, so their values are not covariant. Any combination of values is possible, including [Force{IMP}] and [+Top]: an imperative clause with a non-contrastive topic.

4.3.2 Interactions with Typed C^0

The position and order of features in the left periphery have additional effects on the word order of imperative clauses. These effects go beyond the topic-licensing effects particular to English, which are conditioned on its left-peripheral structure and inventory of complementizers. Most importantly, they show that the clause-typing feature [Force{DEC,INT,IMP}] cannot be as low as the subject licensing position, contra the syntactic analysis proposed in Zanuttini et al. (2012).

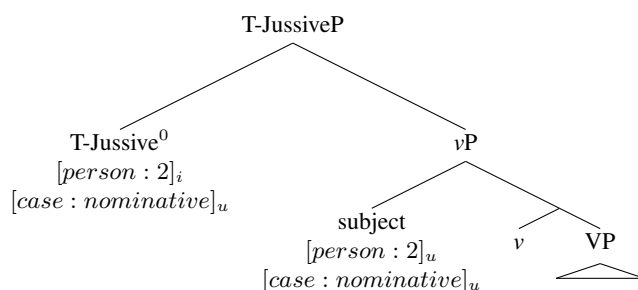
Looking at English again, we find that the position of contrastive topics in imperatives is fixed with respect to all other constituents in the clause edge; the order is Focus > Subject > Verb.

- (24)
- | | | |
|----|------------------------------------------|-------------------------|
| a. | These stocks everyone buy immediately! | ✓Focus > Subject > Verb |
| b. | *These stocks buy everyone immediately! | ✗Focus > Verb > Subject |
| c. | *Everyone these stocks buy immediately! | ✗Subject > Focus > Verb |
| d. | **Buy these stocks everyone immediately! | ✗Verb > Focus > Subject |

Taken in isolation, these word order facts are only informative enough to show that the imperative subject and verb are inseparable (presumably in a Spec/Head configuration), and that contrastive topicalization takes place above both. I have made the more specific claim that focalized elements occupy Spec FocusP, subjects occupy Spec FinP, and the inflected verb occupies Fin⁰. Making just one assumption — that clause typing is encoded as a syntactic feature on a head in the left periphery — is enough to draw this conclusion.

To show that a sparer structure for imperatives does not accurately predict the English word order facts, I will attempt to explain them using the structure proposed in Zanuttini et al. (2012). Recall the proposal that a clause-specific JussiveP, immediately dominating TP and perhaps merged with it, accounts for imperative subject licensing and word order effects.

- (25) JussiveP ≥ TP > vP ...



Presuming that the imperative verb stays low (in v⁰), this structure generates the grammatical order of a

simple imperative with an overt subject: *Everyone buy these stocks!*. If contrastive topics are licensed above JussiveP, it also generates the grammatical order in (24a), *These stocks everyone buy immediately!*, and does not overgenerate the ungrammatical orders (24b–d).

However, since there is no high representation of the [Force{IMP}] feature, this model cannot predict the difference in grammaticality between contrastive and non-contrastive topics. There is no logical way to both generate contrastive topics above JussiveP and forbid non-contrastive topics either in or above JussiveP. On the other hand, a model with a high encoding of Force, such as the extended articulated CP, does make the correct predictions about topic availability.

Consider licensing contrastive topics in an imperative clause with JussiveP. There are two logical possibilities: either the topic is hosted in JussiveP itself or in a higher phrase. If the former is the case, then Jussive⁰ is specified for a [\pm Focus] feature, and when it is valued [+Focus], it attracts a contrastive topic element to its Spec. If the latter is the case, then FocusP selects JussiveP and independently attracts the contrastive topic. So far, this poses no problem for the JussiveP model. However, this breaks down when trying to rule out non-contrastive topics in imperatives.

Regardless of where contrastive topics are hosted, non-contrastive topics must be hosted in a projection above JussiveP. The only option that would allow both contrastive and non-contrastive topics to be hosted in JussiveP would be one where Jussive⁰ bears both [\pm Top] and [\pm Focus] features, while also allowing for the possibility of multiple specifiers. (I assume a single-specifier model throughout this chapter.) If they are hosted in TopP > JussiveP, we could rule out non-contrastive topicalization by stipulating that Top⁰ cannot select a JussiveP complement. If FocusP intervenes, appealing to selection becomes more difficult. Non-contrastive topics can precede contrastive topics in declarative sentences in English.

(26) A: Who bought what?

B: [_{TopP} The book, [_{FocusP} JOHN bought ____].]

To not rule out sentences like B's response in (26), FocusP would have to inherit the imperative feature of JussiveP, and Top⁰ would have to discriminate between FocusP complements based on their featural content.

Positing a high realization of the imperative feature, namely [Force{IMP}] on C⁰, provides a simpler mechanism for ruling out non-contrastive topics in imperatives and allowing them in other clause types. This model is further motivated by the independent evidence for encoding subordination, clause type, and non-contrastive topic features in a single layer in English (Haegeman 2004), which is bolstered by facts about subordinating complementizers (§4.4). Thus the extended articulated CP is the best solution for deriving subject order and topicalization facts.

4.3.3 Negation and *do*-support

One effect of clause typing that operates at a distance is the interaction between imperativity and negation. It has been widely observed that many languages (English being an exception) do not permit the direct negation of imperatives (e.g. Aikhenvald 2010; Han 2000; Zanuttini 1997). In particular, the analysis of Han (2000) focuses on ruling out negative imperatives in languages that lack them by appealing to the hierarchy of adjoined heads and the semantic scope of negation over clause typing. Since I argue for an *in situ* method of clause typing (§4.2.2), problems of this sort do not arise. Placing Neg suitably high in the clausal architecture accounts for word order facts in English and positively determines the position of *do*-support in negative imperatives to be Focus.⁴ No similar prediction can be made in an analysis with less articulated structures.

English allows direct negation of imperatives, but requires *do*-support in such clauses.

⁴The analysis that I present here does not make any claims about the position of *do*-support in other clause types in English, nor about similar phenomena in imperatives in other languages. Each case must be analyzed as the interaction of the available positions and features in the left periphery, as I do for English imperatives here.

(27) Don't buy these stocks!

Don't can be pronounced *do NOT* for emphasis, but cannot be separated, either by a fronted element (28b) or by a subject (28c). This indicates that *do* and Neg are adjoined and occupy a single head position.

- (28) a. Do NOT buy these stocks!
b. *Do these stocks not buy ___!
c. *Do you not buy these stocks!

Subjects cannot appear to the left of *don't* in English imperatives (29a). If subjects are hosted in Fin, the lowest position that Neg can be realized in is Focus. Zanuttini (1997) associates Neg with Focus, which would accurately predict the possible Neg/subject word orders.

- (29) a. *Everyone don't do that! ✗ *high subject*
b. Everyone, don't do that! ✓ *vocative*
c. Don't anyone do that! ✓ *low subject*

The fact that *don't* occupies a single position is beneficial for syntactic analyses that have a unitary CP, since it allows negative imperatives to fit into their minimal structure. However, these analyses don't take into account the fact that contrastive topics can occur in negative imperatives, and when they do they must occur to the left of *don't*.

- (30) a. These stocks, don't anyone/everyone buy ___!
b. *Don't these stocks anyone/everyone buy ___!

Thus *don't* must occupy a position between the host of contrastive topics and the subject position. These

are adjacent Spec positions, namely Spec Focus and Spec Fin, so *don't* must reside in Focus⁰.

4.4 Embedding Imperatives

4.4.1 Imperative Complements and Illocutionary Verbs

English embeds all types of clauses, including imperatives. Similar to how a very restricted class of verbs embed interrogative clauses, only a handful of verbs embed imperatives. The most common embedding verb for imperatives is *say* (31a). The ability to bind into these clauses (31b) shows that they are not instances of direct discourse or quotation (Crnič and Trinh 2009).

- (31) a. John_i said call his_{ij} mother.
b. *John_i said, “Call his_i mother!”

The embedding verb *say* serves an exceptional role in this example. It is not performing the ordinary function of an illocutionary verb (Searle 1975). In fact, early analyses of imperative semantics (e.g. Hamblin 1987) claimed that they were equivalent to paraphrases where a declarative clause was embedded under an illocutionary verb such as *order*. Note that verbs of this sort cannot take imperative complements in English.

- (32) ?John_i ordered [call his_i mother].

Based on the contrast between (31a) and (32), I take the embedding verb *say* to have the semantic effect of shifting a discourse update — i.e., the denotation of a full clause including Force — into another context (see §5.3.2 for a full semantic analysis of embedding *say*). As a result, some speakers accept embeddings with other verbs that specify the manner in which the embedded clause took effect in its original context.

- (33) a. %John demanded [call his mother].
 b. %John insisted [call his mother].
 c. %John indicated [call his mother].

For speakers who reject some or all of the sentences in (33), those embedding verbs do not have the context-shift effect of *say*, but only have an illocutionary reading. All three of the verbs used in (33) can embed a declarative modal clause, with the effect of reporting a command: *John demanded/insisted/indicated that you should call his mother.*

Another effect of the context-shifting meaning of *say* is that it can embed both declarative and imperative clauses. However, neither type of subordinate clause is headed by a [+Top] complementizer. This is true for both *that*-headed (34) and null-headed declaratives (35).

(34) *John said [a book that he bought ____.]

(35) *John said [a book $\emptyset_{SUBORD.DEC}$ he bought ____.]

(36) *John said [a book $\emptyset_{SUBORD.IMP}$ buy ____.]

These facts, in conjunction with the unavailability of non-contrastive topics in matrix imperatives (§4.3.1), lets us complete the paradigm of complementizers in English, accounting for all three of their features: [\pm Sub], [Force{DEC,INT,IMP}], and [\pm Top]. (The symbol \emptyset indicates the presence of a null complementizer, while \times indicates that there is no complementizer — overt or null — with that combination of features.)

(37) *English complementizer inventory*

	[-Sub]		[+Sub]	
	[-Top]	[+Top]	[-Top]	[+Top]
declarative	∅	∅	that, ∅	✗
interrogative	∅	✗	if, whether	✗
imperative	∅	✗	∅	✗

Matrix imperatives are not exceptional in disallowing non-contrastive topics in English. If any clause type can be seen as exceptional with respect to topicalization, it is matrix declarative clauses, the only clauses that permit non-contrastive topics.

Despite being valued [-Top], embedded clauses do still contain a FocusP layer, which can host contrastive topics. This holds for both declaratives and imperatives embedded under *say*.

(38) John said [_{CP} that [_{FocusP} these stocks he bought ____.]] (...not those.)

(39) John said [_{CP} ∅_{SUBORD.IMP} [_{FocusP} these stocks buy ____.]] (...those avoid.)

This is further evidence for the three-layer system in English. The most complex of those layers, CP = Sub/Force/TopP, cannot realize all twelve of its logical feature combinations. To simplify the system, it is largely the [+Top] variations that have been left out of the lexicon.

4.4.2 Extraction from Embedded Imperatives

Given that imperative clauses can be embedded, what kind of extraction properties do they have? Since imperative clause typing is performed in the same manner and in the same location as other clause typing, they should behave similarly to other embedded clauses. There are three traditional types of extraction domains: strong islands, weak islands, and non-islands. The types of extraction or long-distance dependencies

that a clause can participate in are determined by its island status (van de Koot and Mathieu 2003).

(40)

	Strong Island	Weak Island
Wh-argument extraction	✗	✓
Wh-adjunct extraction	✗	✗
NPI licensing	✓	✗
Anaphoric binding	✓	✓

I show that, at least in English, none of these three categories fully describes the extraction and dependency behavior of imperatives. They are not strong islands, because various tests show no evidence for an Operator in the highest Spec position of the embedded imperative, which would block the clausal “escape hatch” and all types of extraction. Certain types of extraction from imperatives fail because the syntax of the imperative clause prevents the targeted item from moving to its left edge. Additionally imperatives show one of the properties of weak islands, blocking of NPI licensing from the matrix clause. No single island type shares all three of these properties. Like all types of islands, they do allow anaphoric binding from the higher clause, as shown above in (31).

I now demonstrate these several properties of embedded imperative in English. All of these properties are consistent with the clausal architecture proposed in the preceding sections, in combination with an *in-situ* method of clause typing.

Wh-extraction vs. relativization

One type of extraction that is generally prohibited is Wh-movement out of an imperative. This holds for both argument and adjunct Wh-questions.

(41) a. *Who did John say [___ send ___ to the store]?

- b. *Where did John_i say [____ send his_i mother ____]?

For Wh-extraction to proceed, the Wh-element must initially move to the Spec CP position within the embedded clause. If this movement is prohibited, extraction will fail. One way to prevent such movement is if there is an Operator occupying the Spec CP position, thereby blocking the “escape hatch” out of the embedded clause.

However, if a filled Spec CP is the reason for blocking extraction, then all types of extraction should be blocked, but this is not the case. For example, relative clauses headed by an element that originated in an embedded imperative are fully grammatical.

- (42) a. The book that John said [____ read ____ by tomorrow] wasn't at the library.
b. The place where John said [____ meet him ____] was hard to find.

If extraction out of relatives is possible, then there cannot be an Operator filling Spec CP, and Wh-extraction must be blocked for a different reason. I argue that movement of a Wh-phrase to Spec CP in an embedded imperative is impossible, but that this is due to the content of C⁰, not Spec CP. In every typed clause, C⁰ must bear a Force[] feature. Only a head that bears a Force[INT] feature can also bear a [+Wh] feature and attract a Wh-phrase. Accordingly, when C⁰ bears Force[IMP], the Wh-phrase cannot move to the escape hatch position and cannot be extracted. This is a purely syntactic fact, as a matrix interrogative can license a Wh-element in an embedded imperative as long as it remains *in situ*, for example in an echo question.

- (43) John said [send WHO to the store?]

Matrix imperatives can also host echo question elements. It seems trivial that a matrix clause cannot be simultaneously interrogative and imperative — something along the lines of **Who send to the store!* —

but Wh-extraction from an imperative would require exactly that sort of representation for extraction to succeed. Relativization, on the other hand, takes advantage of topicalization, a process already available in matrix imperatives, to move an element to the embedded clause edge and make it eligible for extraction.

Topic extraction vs. clefting

Extraction of a topic from an imperative is possible, but only if the topic is eligible for movement within the imperative clause. As shown in §4.3, only contrastive topics can move to the left periphery in English imperatives. Exactly parallel to the case of Wh-extraction vs. topicalization above, it follows that only contrastive topics can move to the clause edge and be extracted into a higher clause.

- (44) a. *A book, read ____! *matrix topic*
 b. *John said [a book, read ____]. *embedded topic*
 c. *A book, John said [read ____]. *extracted topic*
- (45) a. These stocks buy ____! *matrix topic*
 b. John said [these stocks buy ____] *embedded topic*
 c. These stocks, John said [buy ____]. *extracted topic*

Contrastive topics containing anaphors can even allow reconstruction.

- (46) HIS_i STOCKS John_i said [sell ____ right away]; BOB's he said [hold ____ for now].

Clefting out of an imperative ought to pattern similarly, but it poses an apparent puzzle: it is possible to cleft an element from an embedded imperative, moving it into the matrix clause (47), but it is impossible to have a cleft in a matrix imperative clause (48).

- (47) a. It's this book (that) John said [read ____].
 b. ?It's at the library, John; said [meet him; ____].
- (48) a. *It's this book, read ____!
 b. *It's at the library, meet me ____!

This seems paradoxical, but is resolved by the fact that a “matrix” cleft is inherently biclausal, so the cleft extraction in (47) is actually a tricausal construction. The additional clausal layer hosts the clefted element and selects a declarative clause as its complement. In (48), only an imperative clause is available, and the sentences are ungrammatical. However, in the case of embedding, clefting can target the matrix declarative clause; the type of the embedded clause is not of consequence for the local selection relation. Extraction can then proceed in a long-distance fashion, directly from the edge of the embedded imperative to the cleft position.

NPI licensing

The clause edge also has effects on non-movement phenomena that have to traverse it. Licensing of a negative polarity item from a matrix clause into an embedded imperative (49) is degraded. Contrast (50), which allows the NPI *anything* to be licensed by matrix negation, yielding the interpretation “John said buy nothing.”

(49) ?John didn't say [buy anything].

(50) John didn't say [to buy anything].

Note that (50) also has a second interpretation, in which the act of saying is negated and *anything* assumes a free-choice interpretation. This is the less salient reading, but may be coerced with proper contextual or

prosodic support. The fact that attempting to license *anything* as an NPI seems to be the default parsing strategy could explain why (49) sounds odd, but not outright ungrammatical.

Synopsis

The possibilities for extraction from imperative clauses are summarized in the following table.

(51)

	Strong Island	Weak Island	Imperative
Wh-argument extraction	✗	✓	✗
Wh-adjunct extraction	✗	✗	✗
NPI licensing	✓	✗	✗
Anaphoric binding	✓	✓	✓

Imperatives do not behave quite like any other clause or island class when it comes to extraction. This is due to a combination of several factors: the absence of an Operator in Spec CP, featural restrictions on C^0 that bears Force[IMP], and the permissibility of different types of information-structural movement below CP. Thus English imperatives are not representative of a new class of extraction barriers, but derive their extraction restrictions from independent motivations.

4.5 Summary

This chapter has examined previous syntactic approaches to imperative clauses and the more general issue of clause typing. I have argued that an articulated left-peripheral structure is necessary to accommodate imperative clause typing and the various fronting phenomena found in English imperatives. Furthermore, English word order demonstrates that clause typing is performed *in situ* in English, so neither head movement nor remnant movement can be required for clause typing crosslinguistically. Several phenomena in

English imperatives exploit the extended articulated left peripheral structure for English, which has three layers: CP > FocusP > FinP. The independence of the FocusP position and its ability to host contrastive topics explains the difference in acceptability between contrastive and non-contrastive topic fronting in English imperatives. Word order facts also determine the locus of imperative subjects in Spec FinP and *do*-support in Focus⁰. Finally, the possibilities for extraction from embedded imperatives confirm that the same left-peripheral structure is present in matrix and embedded clauses in English. In the next chapter, I map preference semantics onto these positions and show that clause typing is performed in a compositional manner.

CHAPTER 5
IMPERATIVES AT THE SYNTAX/SEMANTICS INTERFACE

5.1 Introduction

This chapter seeks to combine the insights of Chapters 3 and 4 by mapping semantic concepts onto syntactic positions. A major feature of the preference semantics adopted in §3.4 is the separation of propositional and illocutionary content. I now undertake to map those pieces of content to the syntactic structure: constituents below Force^0 in the left periphery encode propositions; Force^0 encodes illocutionary relation by taking its complement (FocusP) and outputting an update (ForceP). These divisions follow the analysis of fronting in English imperatives in §4.3, which identified clause-typing and information-structural positions.

The chapter is organized into two parts. §5.2 spells out the mapping between imperative content and structure in greater detail and shows how propositional and illocutionary content are composed. I also argue that the syntax/semantics interface for imperatives proposed in Zanuttini et al. (2012) is not compositional in the same manner. §5.3 takes the compositional approach developed for matrix clauses in the preceding section and applies it to embedded imperatives. Preference semantics offers a way of defining embedding verbs in terms of shifted preference states, i.e. ones that do not correspond to the current discourse state. I adapt Starr's (2010) definition of the question-embedding verb *wonder* to the multi-type embedding verb *say*.

5.2 Mapping Preferences to Projections

The preference semantics of Starr (2012) builds clausal meaning starting at the propositional level. Given a proposition p , a force operator can be applied to it to form a declarative $\triangleright p$, polar interrogative $?p$, or imperative $!p$. The surface indication of the force operators is taken by Starr (2012) to be the holistic

notion of declarative, interrogative, or imperative syntax, comprising word order, verbal morphology, and other surface effects. However, the operators themselves correspond to illocutionary relations (Murray 2011), which by definition take a proposition and the discourse context as their arguments. This recalls the Clause Typing Hypothesis of Cheng (1991):¹

(1) *Clause Typing Hypothesis*

All clauses contain an element that scopes over a propositional constituent (TP) and specifies its discourse function. (Cheng 1991)

Cheng (1991), working prior to the articulated CP as introduced by Rizzi (1997), assumed that TP was the highest propositional constituent and that it was dominated by a unitary CP projection. Nevertheless, the basic framework of the Clause Typing Hypothesis can be adapted to the articulated CP argued for in Chapter 4 by specifying the position of the clause-typing element, Force⁰, and the propositional constituent, FinP.

(2) *Revised Clause Typing Hypothesis*

All clauses contain a Force⁰ head that scopes over a propositional constituent (FinP) and applies a force operator to it.

The remainder of this section is devoted to motivating the changes made in (2), including giving a semantics for Force⁰ heads valued for [Force{DEC,INT,IMP}] and showing that FinP is the minimal propositional constituent on which it can operate.

¹See §4.2.2 for full discussion of the syntax of clause typing, particularly in English imperatives.

5.2.1 Illocutionary Content and Illocutionary Positions

The illocutionary content of a clause is that portion of its meaning that constrains its discourse function. In the framework of preference semantics, this means determining which type of update rule (§2.4.1) will be applied to the propositional content of the clause. All typed clauses denote updates of type $\langle rr \rangle$ (functions from one preference state, abbreviated type r , to another preference state); these updates are then applied to the discourse context (at least in the case of matrix clauses; see §5.3 below for discussion of syntactically embedded constituents that denote updates).

Recall from §2.4.1 that a single discourse update will perform several transformations on R , the preference state that represents the discourse context at the time of utterance. An imperative update performs three distinct operations on R :

(3) *Imperative update* (Starr 2010; 2012)

$$R[!p] = R \cup \{\langle c_R[p], c_R - c_R[p] \rangle\} \cup \{\langle a[p], a - a[p] \rangle \mid a \in C_R \ \& \ a[p] = \emptyset\}$$

- a. Admits all of the preferences in R .
- b. Introduces a global preference for all p -worlds over all $\neg p$ -worlds $\langle p, \neg p \rangle$
- c. Introduces local preferences within already-present alternatives $\langle a \cap p, a - p \rangle$

These update effects are not separable, but are all contained in the force operator $!$, which is a primitive of the semantic system. Therefore, when mapping the illocutionary content of a clause to its syntactic structure, there will not be any syntactic element responsible for only a portion of the transformations it performs on R . For example, in imperatives, there is no element that specifies the introduction of a new global preference $\langle p, \neg p \rangle$ without also specifying the other components of a complete imperative update. This is in contrast with the individual “arguments” of Op_{imp} in the modal analysis, the modal base f , the ordering source g , and the time of evaluation t . Kaufmann (2011) gives each of these elements distinct syntactic positions, but they do not appear to be individually targeted by either the syntax or the semantics (e.g. they cannot

be referred to anaphorically, see §3.2.2).

Given that force operators are not decomposable, they must occupy a single syntactic position. In §4.2.2 I argued for *in situ* clause typing, attributable to the featural content of Force^0 . The syntactic features $[\text{Force}\{\text{DEC}\}]$, $[\text{Force}\{\text{INT}\}]$, and $[\text{Force}\{\text{IMP}\}]$ are present on the Force heads that contribute \triangleright , $?$, and $!$, respectively. Each force operator, representing an illocutionary relation, requires two arguments: a proposition and a discourse context. The proposition is the semantic argument of the illocutionary relation, and the context is its pragmatic argument. Assuming that pragmatic information cannot be directly mapped onto the syntax, only the propositional argument will be contributed syntactically. Thus the discourse context argument lies outside the clausal structure.²

Accounting for all of these considerations, the interface-visible semantics of Force^0 will behave like a one-place predicate, which takes a proposition as its single argument. The complement of Force^0 can be any left-peripheral constituent that denotes a proposition: minimally FinP, but also FocusP or TopP if they are present in the derivation. Each force operator denotes a function that takes a proposition and outputs a function from preference states to preference states. Adopting r as a shorthand for the semantic type of preference states, the semantic type of Force^0 can be written as $\langle st, rr \rangle$. The entire clause — a well-formed update function — is thus of type $\langle rr \rangle$. The semantics of Force^0 for the three major clause types is summarized below.

(4) Force operators of type $\langle st, rr \rangle$

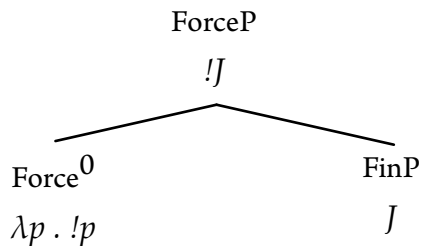
Sentence type	Semantics of Force^0
declarative	$\lambda p. \triangleright p$
interrogative	$\lambda p. ?p$
imperative	$\lambda p. !p$

²I take this to be true for both matrix and embedded clauses. In matrix clauses, the clause's content is passed to the pragmatic component, which supplies the current R . In embedded clauses, the material of the higher clause — specifically the embedding verb — indicates a contextual shift. See §5.3 for further discussion of the mechanics of contextual shift in embedded imperatives.

Any of the Force heads can combine with a propositional constituent to form the complete meaning of the sentence, in the terms of Starr (2012). Preference semantics is a propositional logic, so propositions are primitives, notated with capital letters such as $J = \textit{Patrick jumps}$. A *propositional radical* of this sort “is not a well-formed sentence, but it still has a semantics like any sub-sentential constituent.” (Starr 2012:24). I return to the composition of propositional radicals in §5.2.2 below.

Taking a propositional radical, for example J , applying the semantics of an imperative Force^0 to it will give the well-formed semantic representation $!J$.³

(5) *Patrick, jump!*

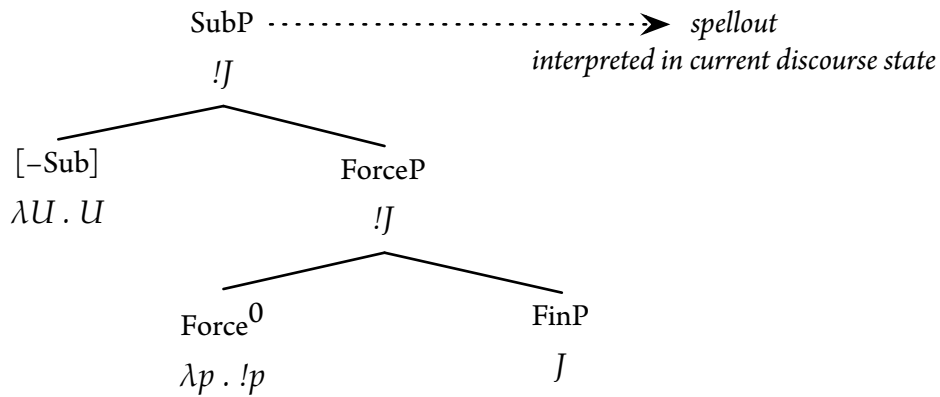


Applying the illocutionary relation in this manner gives a simple, compositional approach to building sentence meaning out of propositional meaning. Note that there is no part of the structure in (5) below Force^0 that makes reference to preference states. Therefore, there is no problem of the sentence-level denotation being ambiguous with the denotation of a constituent in the verbal domain, as there is in the property analysis (§2.3). In the preference analysis, there are only two levels in a clausal representation that can be of type $\langle rr \rangle$, ForceP and SubP . If the schematic subtree in (5) is representative of an English sentence, only one level can be of type $\langle rr \rangle$, since Sub , Force , and Topic are combined on a single C head (§4.2.1). In languages with a distinct SubP , its head does not introduce any new argument structure, but acts as an identity function. It makes the syntactic contribution of indicating whether there is superordinate material governing the typed clause denoted by ForceP . If there is no superordinate material, the update is passed to

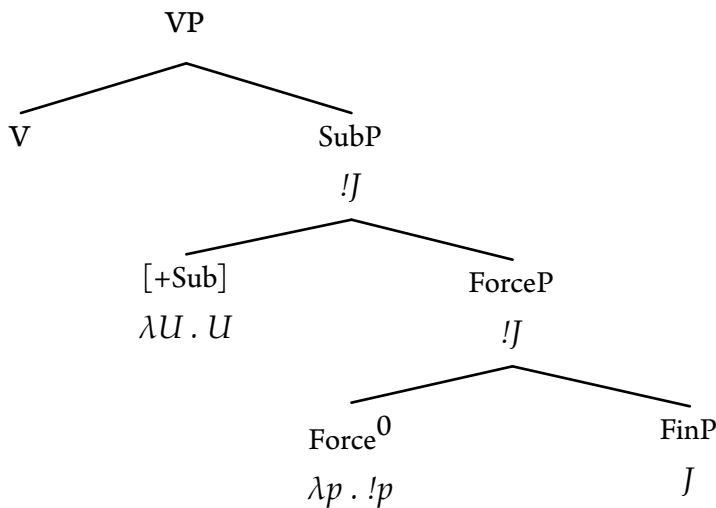
³! J is not a completely saturated representation, when taking into account the pragmatic argument of the illocutionary relation, but it is all that can be contributed at the level of a clausal constituent, SubP or ForceP .

the pragmatic component of the grammar (6), where it operates on the current discourse state R . If there is superordinate material, the update is passed to the embedding verb (7), which specifies the context in which it should be interpreted (for more discussion, see §5.3.2 below).

(6)



(7)



As represented in (6) and (7) above, the semantics of Sub^0 is the identity function, evaluated with respect to a certain context. An alternate expression of its semantics would be to supply the discourse or shifted context as the result of pragmatic reasoning based on the syntactic marking of the clause as matrix $[-\text{Sub}]$ or subordinate $[\text{+Sub}]$. I return to the concept of context-shifting and its relation to the semantics

of embedding verbs in §5.3.2 below.

5.2.2 Propositional Content and Propositional Positions

I now turn to restrictions on the propositional material that can be passed to the imperative force operator, and also look at the manner in which it is composed. In the examples in the preceding subsection, the scope proposition of ! has been represented as $J = \textit{Patrick jumps}$, the extension of which is the set of worlds in which Patrick jumps. However, this is merely a semantic representation; this sentence cannot have a DP *Patrick* as its syntactic subject, since the sentences **Patrick jumps!* and **Patrick jump!* are not well-formed English imperatives. Presumably the meaning ! J is best mapped onto a sentence with a null or pronominal subject (*Jump!* or possibly *You jump!*), spoken in a context where Patrick is the sole addressee.⁴ Optionally, Patrick can be singled out as the target of the command by using a vocative, such as the well-formed *Patrick, jump!*.

How then should null imperative subjects be represented at the interface with preference semantics? Intuitively, it's clear what a null imperative subject should refer to: the set of addressees. When addressing Patrick with an imperative, preferences are established regarding Patrick's actions; when addressing a classroom full of students, preferences are established about the students' collective or coordinated actions.⁵ However, it appears incorrect to assume that null imperative subjects perform quantification or maximization over the set of addressees. Universal quantifier subjects, such as *everyone*, allow for restriction of their

⁴Although see arguments in Zanuttini (2008) that plain DP subjects are more freely permissible in English imperatives than commonly thought. Even so, DP subjects are widely rejected as incongruent with contexts that do not introduce focal alternatives regarding the subject (cf. discussion in §3.3.4).

⁵Whether an imperative is taken to prefer collective or coordinated action is dependent upon the action itself. When issuing the imperative *Sit down!* to several addressees (without deictically indicating a single individual), it requires collaborative action: each individual addressee must perform the action of sitting down to bring about the preferred proposition. On the other hand, *Open the window!* addressed to the same group only requires that the addressees coordinate in such a way that the window is opened; they don't all have to physically lift the window handle. Other actions, such as the one preferred in *Read the passage aloud!* lie in a grey area. If half of the audience comply, there is a sense in which the preferred proposition is "truer" than in the case where the audience is ordered to stand up and half of them remain sitting. These are subtle judgments about the truth of quantificational propositions, and are not imperative-specific phenomena. Since preference semantics is a non-quantificational logic, I cannot pursue the issue further here, but present the data for further inquiry.

domain via modifiers (8), and these modifiers can be extraposed either leftward (8a) or rightward (8b) in English imperatives. The same cannot be done with a null subject (9).

- (8) a. Everyone except John stand up!
b. Except John, everyone stand up!
c. Everyone stand up, except John!

- (9) a. ***pro* except John stand up!
b. *Except John, *pro* stand up!
c. **pro* stand up, except John!

One possible explanation for these facts is that the null subject simply cannot license an adjoined modifier in the configuration [*pro* except NP]. But even in cases where the restriction is performed by a clausal modifier that is in no direct syntactic relationship with the subject, overt quantifier subjects are restrictable while null subjects are not.

- (10) a. Although John doesn't have to, everyone stand up!
b. #Although John doesn't have to, stand up!

With these facts in mind, it is possible to return to the question of how the imperative subject should be represented in preference semantics. The logic of preference semantics does not provide quantifiers, but only predicates and names (Starr 2010:172). Therefore the null imperative subject must also denote something of type e , as names do. Following Murray (2011), I use a special constant u , whose denotation $\llbracket u \rrbracket^R$ is determined relative to a context, such that u is the individual corresponding to the addressee(s) in every world in the context set C_R .⁶

⁶Cf. the special null element *IMPPRO* and its meaning as given in Schwager (2006); Kaufmann (2011).

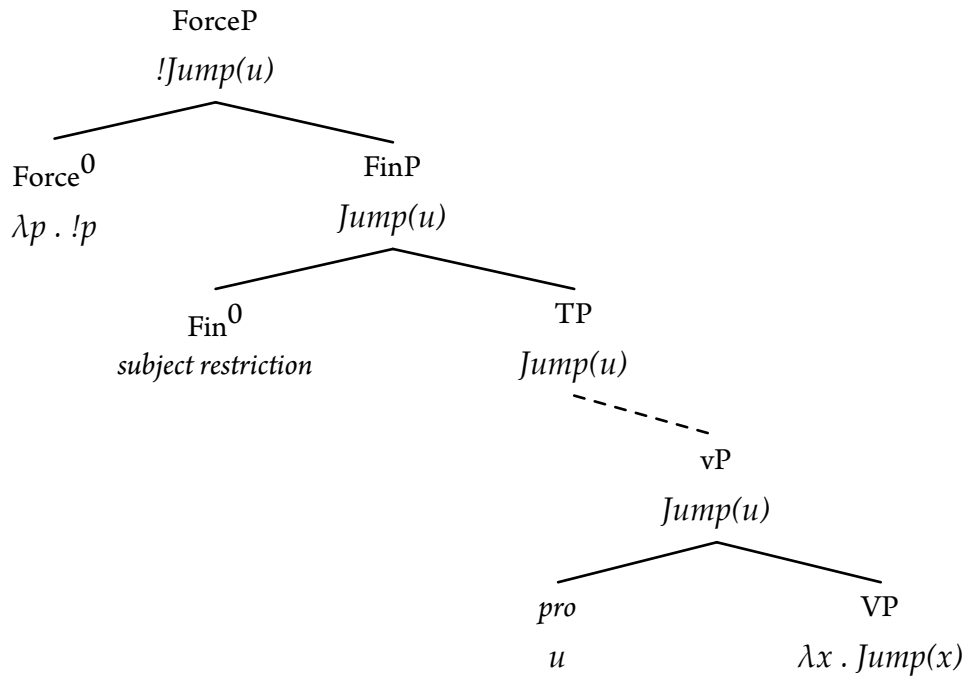
(11) *Definition of u*

$$\llbracket u \rrbracket^R := x \in D \mid \forall w \in c_R : x = \text{addressee}(w)$$

Imperatives restrict their subjects to $\llbracket u \rrbracket^R$. This same type of restriction is imposed in the property analysis of imperatives, where Jussive⁰ adds the subject restriction via abstraction. However, in so doing, the content of JussiveP becomes a property rather than a proposition. Thus, in a preference semantics model, the subject restriction cannot be imposed via abstraction, as properties are incompatible with force operators, and the semantic derivation would crash. Thus two projections are required to accomplish both subject licensing and clause typing. I maintain that the role of ForceP, when distinct, is solely the contribution of illocutionary relation, which takes a proposition and returns a function from preference states to preference states. The role of FinP is a function from propositions to propositions $\langle st, st \rangle$, which returns its scope so long as the subject meets the criterion of being an addressee. Given the definition of u , this criterion is always met when an imperative has a *pro* subject; put differently, *pro* subjects of imperatives can only refer to the addressee(s).

Thus the overall composition of a simple imperative, such as *Jump!*, is as in (12). The dashed line between TP and vP indicates that other projections within the aspectual/inflectional domain may intervene. Similar to information-structural positions (§4.2), the heads of these projections contribute additional information but output elements of the same semantic type as their input. Another similarity between this domain and the left periphery is that the number of positions between TP and vP may vary according to economy of structure and language-specific factors.

(12) *Jump!*



The tree in (12) omits the information structure positions TopP and FocusP, whose syntactic effects are discussed in §4.3. Here I assume that, when present, information structure positions are also functions from propositions to propositions $\langle st, st \rangle$. The additional information they contribute (beyond the semantic type of their output) does not bear directly on the issues of compositionality considered here.⁷

5.2.3 Comparison to Property-denoting Positions

The preference analysis of imperatives, in addition to its improved empirical coverage, avoids compositionality problems that arise for the property analysis (Portner 2004a; 2007; Zanuttini et al. 2012). Firstly, as sketched out in (12) above, in the preference analysis there is no position above VP that corresponds to a property; every maximal projection corresponds to either a proposition $\langle st \rangle$ or an update $\langle rr \rangle$, and this holds across all clause types, not just imperatives. In the property analysis, on the other hand, imperatives

⁷Although information-structural factors may bear on the computation of relevance, even in preference semantics, insofar as they may introduce alternatives; see §3.3.4.

are the only clause type that have a “high” property projection. Zanuttini et al. rejects ForceP as the clause-typing position, saying, “Clearly jussive particles are not in [ForceP]” (2012:1258). Since the property denoted by the clause must then be picked up by a pragmatic function that assigns it to a To-Do List in the discourse representation,⁸ this more or less requires that T/JussiveP is the highest clausal projection.

Constructing imperative meaning as properties in JussiveP causes two problems for compositionality. First, in cases where JussiveP cannot be the highest projection in the clause, how are other elements permitted to combine with it? Second, can the semantic contribution of Jussive⁰ be isolated, and if so, what is it? The allegedly compositional analysis given in §4 of Zanuttini et al. (2012) does not seem to provide answers to either of these questions.

Can imperative properties be semantic arguments?

The primary reason for generating properties as the semantic representation of imperative clauses is for them to serve as the objects of the pragmatic To-Do List assignment function. For any semantic element to be picked up by the pragmatic component of the grammar, it must correspond to the highest level of the clausal structure. However, JussiveP immediately dominates TP or, in certain cases, even fuses with TP. This leaves no room for higher left-peripheral positions, including information structure positions, but I have shown that it is possible for constituents to be fronted to higher positions, such as TopP and FocusP (§4.3).

The presence of information-structural positions above JussiveP is not ruled out by Zanuttini et al. (2012), but positing them comes at a price when considering their semantics. In the property analysis, it is impossible for each information-structural head to have a unified semantics and select a certain semantic type (e.g. propositions) as its argument. One possibility is that there are multiple versions of each information-structural head in the lexicon: one which takes propositions, another that takes sets of propositions, and another that takes properties. But this seems to be require unnecessary homophony, since

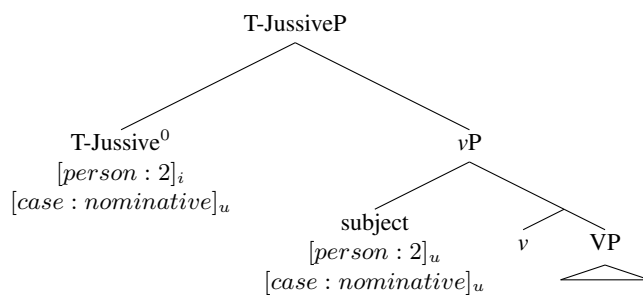
⁸See §2.3 for further detail on the pragmatic manipulation of properties in the analyses of Portner (2004a; 2007).

topicalization and focalization markers are null in many languages, and in languages where they are overt they do not typically change form based upon clause type. The other possibility is to maintain that there are single instances of each information-structural head, but they are pure identity functions, which are agnostic as to the type of their argument. This seems undesirable, because it requires more stringent syntactic constraints on information-structural heads, since an untyped identity function could in theory take any constituent as its argument, but Topic^0 and Focus^0 cannot freely appear at any position within the clausal, verbal, or nominal domains.

Can the semantics of Jussive^0 be isolated?

Independent of interactions with other positions, it remains to be shown that semantically typing imperatives by transforming propositions into properties can be done in a compositional manner. Zanuttini et al. (2012) gives a schema for the syntactic structure of a simple imperative, reproduced in (13), where $\text{T}/\text{Jussive}^0$ immediately dominates vP .

(13)



vP is taken to represent an ordinary proposition, such as $\lambda w . x \text{ jumps in } w$, and the overall denotation of the clause is supposed to be a property, such as $\lambda x : x = \text{addressee}(c) . [\lambda w . x \text{ jumps in } w]$. However, Zanuttini et al. (2012) does not give a definition for the semantics of Jussive^0 alone, but only states that it is “an abstraction operator (i.e., a λ , or a binding index in the framework of Heim and Kratzer (1998))”. But the restriction of x to addressees goes beyond ordinary Predicate Abstraction (14), which only requires

that $x \in D$.

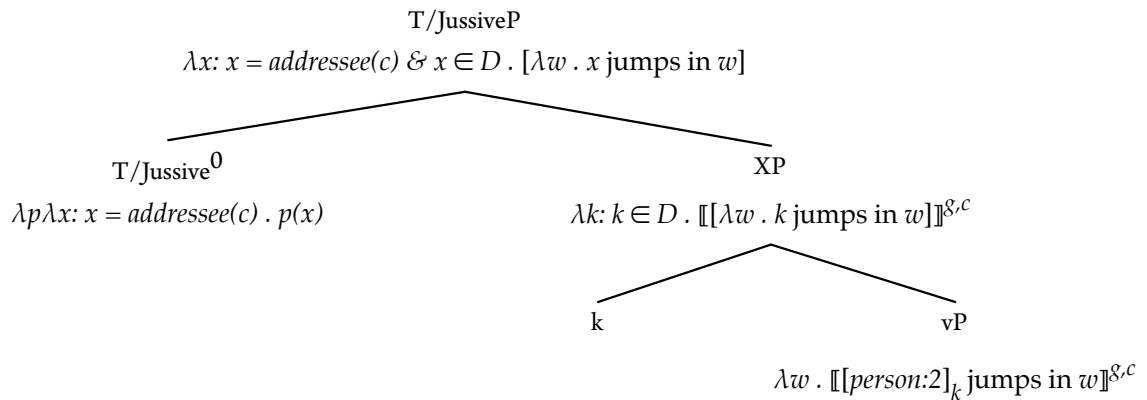
(14) *Predicate Abstraction* (Heim and Kratzer 1998:186)

Let α be a branching node with daughters β and γ , where β dominates only a numerical index i .

Then, for any variable assignment a , $\llbracket \alpha \rrbracket^a = \lambda x \in D . \llbracket \gamma \rrbracket^{a[x \rightarrow i]}$.

Also of note is the interface requirement in (14): “ β dominates only a numerical index i .” Thus, in order to invoke Predicate Abstraction, or even a variation that alters its restriction on x , the sister of the propositional projection must be the binding index i . Despite the fact that Zanuttini et al. (2012) claim that Jussive⁰ itself is a binding index, it carries additional syntactic features which could disqualify that interpretation. If Jussive⁰ does not meet the criteria imposed on β in (14), then it will have to occupy the next highest position in the tree (15) and act as a function from properties to properties $\langle \langle e, st \rangle, \langle e, st \rangle \rangle$ to restrict x further.

(15)



Separating out subject abstraction and restriction to addressee may not be an undesirable consequence; after all, limiting the subject in this way is an imperative-specific phenomenon.⁹ Only applying the $x \in$

⁹Or, as Zanuttini et al. (2012) argue, at least a jussive-specific phenomenon in languages that allow 1st and 3rd person jussives.

addressee(c) restriction to properties ensures that it will only occur in imperatives, under the property analysis. However, it is unclear whether the combination of domain restrictions as shown in (15) is permissible in ordinary lambda calculus. Even if it is, specifying that $x = \textit{addressee}(c) \ \& \ x \in D$ is redundant, since certainly the addressees are all individuals. Thus this semantics for $\textit{Jussive}^0$ makes some good predictions, but is suboptimal.

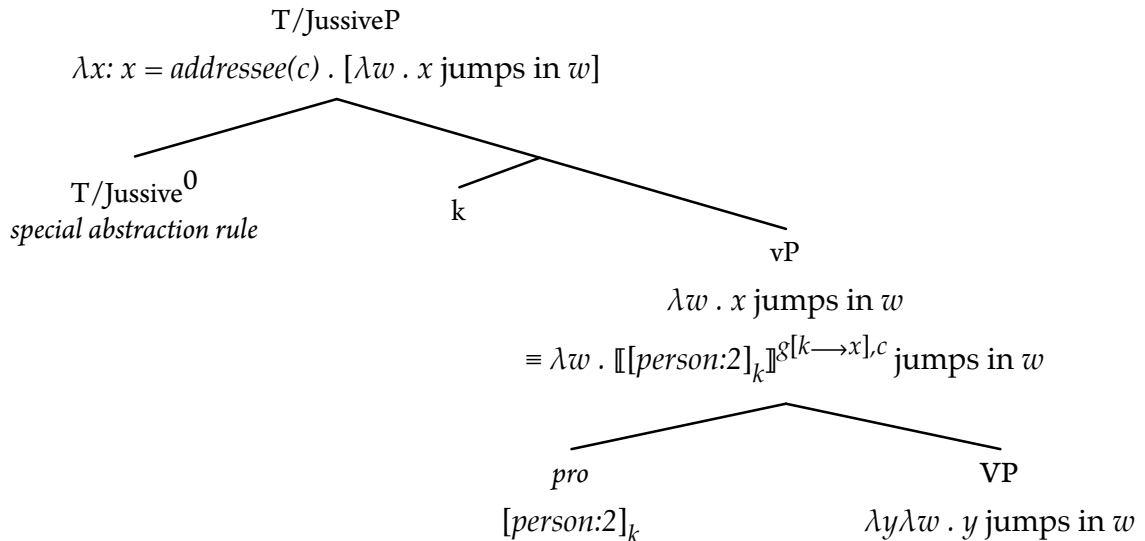
Another option is the one invoked by Zanuttini et al. (2012): do not provide an independent semantics for $\textit{Jussive}^0$, but instead posit a special abstraction rule that applies only to phrases headed by it (16). This requires a slightly different syntactic representation than given in (15) above, albeit one that is closer to the one that Zanuttini et al. (2012) provides (13).

(16) *Semantics for JussiveP* (Zanuttini et al. 2012)

For any phrase XP,

$$\llbracket \textit{Jussive}^0 [\textit{person}: v]_k \textit{XP} \rrbracket^{g,c} = [\lambda x : x = \llbracket [\textit{person}: v]_k \rrbracket^{g,c} . \llbracket \textit{XP} \rrbracket^{g[k \rightarrow x],c}]$$

(17)



The most curious part of this rule and its application is that it is defined over any XP, despite the fact that it ought to be restricted to propositional constituents, likely vP or TP. As defined, $Jussive^0$ can abstract over any element, although its output may be incoherent if applied to a non-proposition, for example a DP. The ability to combine with various propositional projections, including information-structural projections, could be an asset; unfortunately, Zanuttini et al.'s (2012) syntactic analysis places $JussiveP$ too low in the structure for this to be possible.

The special abstraction rule in (16) deviates from Heim and Kratzer's (1998) Predicate Abstraction in one other way: in the configuration given, β is $Jussive^0$, a functional head, and γ is XP, a maximal projection. Predicate Abstraction is defined to cover constructions such as Wh-questions and relative clauses, in which the β operator occupies a Spec position. There is no general prohibition against heads acting as operators, rather than maximal projections, but this is a further reason why the special abstraction rule (16) is not just an application of ordinary Predicate Abstraction.

These interface concerns are good cause for adopting the preference analysis over the property analysis. Preference semantics offers straightforward composition of force operators with their propositional arguments, as well as a unified treatment of clause meaning. Treating all clauses as type $\langle rr \rangle$ not only simplifies the pragmatic component of the grammar, but eliminates redundancy in the semantics of embedding verbs, as shown in the next section.

5.3 Semantics for Illocutionary Embedding

Any semantic system that defines clausal meaning should also have an account for how clauses can be embedded, both semantically and syntactically. The property analysis allows for the possibility of embedding imperatives (§2.3.3), but Zanuttini et al. (2012) does not investigate its semantic consequences. Explaining the embedding of different types of clauses within the property analysis requires both semantic and syntactic selection features, which will lead to difficulties with general-purpose embedding verbs like *say*.

On the other hand, preference semantics is designed as a dynamic update semantics, so its primary purpose is manipulating discourse representations with clause-level updates (§2.4.1). Due to the prevailing, albeit inaccurate, view that imperatives cannot be embedded (§4.4), Starr (2010; 2012) do not define a semantics for a verb that embeds an imperative clause. However, Starr (2010) does provide a definition for an interrogative-embedding verb, *wonder*, upon which I will build a preliminary definition for imperative-embedding verbs.

5.3.1 The Impossibility of Embedding Imperative Properties

Under the property analysis of imperatives, each clause type denotes a different semantic type, so any embedding verb that can take various clause types as its complement must have multiple, homophonous forms. For example, verbs of saying in Korean allow embedding of full clauses under the subordinator *ko* (18). I will examine the English verb *say*, which can take a declarative, interrogative, or imperative (19) clausal complement.

- (18) Emma-ka Inho-eykey kongpuha-la-ko hasiess-ta.
 mother-NOM Inho-DAT study-IMP-COMP said(honorific)-DEC
 Mother told Inho to study. (Zanuttini et al. 2012:1268, ex. 50a)

- (19) John said [call Bill].

If we assume that the meaning of the embedded imperative in (19) is the same as a matrix imperative, under the property analysis it would denote $\lambda x : x = \textit{addressee}(c) . x \textit{ calls Bill in } w$. Since *said call bill* consists of the verb *say* and its complement, we can take it to form a VP, which should also be a property. This means that the verb *say*, when taking an imperative clausal complement, has to take a property and return another property (which is to be later saturated by its subject). However, it is clear that *say* cannot take

any property-denoting XP as its complement.¹⁰ VP complements are impossible, and even non-imperative XPs whose denotation is derived by predicate abstraction, such as Wh-relatives (Heim and Kratzer 1998), are as well.

(20) *John said [which Bill called]

Semantic selection of a predicate-denoting XP is an insufficient constraint on the types of complements *say* can take. To compensate, a syntactic restriction could be posited: *say* only permits clausal constituents as its complement. However, what qualifies as a clausal constituent in the framework of Zanuttini et al. (2012)? Imperatives are JussiveP, except in Korean they can be dominated by a CP layer. Presumably embedded declaratives introduced by *that* are also CPs. However, on the analysis of Heim and Kratzer (1998), so are relative clauses, yet (20) is ungrammatical.

This leaves only two possible solutions, neither ideal. The first option is that *say* must be sensitive to the *exact type of abstraction* represented in its complement. Even if this could be implemented in traditional lambda calculus, it would have to be done intensionally to correctly predict the corner case model where $\{addressee(c)\} = D$. The superior option is to rely on the syntactic selection features of *say*. If only clausal constituents contain SubP (allowing the possibility that relative clauses and the like may contain ForceP but not SubP), then syntactic selection can rule out ungrammatical cases like (20). However, while positing structure of this sort is ideal for accounting for a variety of syntactic phenomena in imperatives,¹¹ it directly contravenes Zanuttini et al.'s (2012) structural claims. For this reason, to develop an accurate interface account of imperative embedding, we must leave the property analysis behind.

¹⁰See (Starr 2012:10) for similar criticisms of determining the pragmatic role of a constituent solely by semantic type.

¹¹As discussed in Chapter 4, these include the mechanism and locus of clause typing (§4.2.2), information-structural fronting possibilities (§4.3), and syntactic embedding and extraction phenomena (§4.4).

5.3.2 Embedding Imperative Preferences

In preference semantics (Starr 2010; 2012), all clauses are updates — functions from preference states to preference states $\langle rr \rangle$ — regardless of clause type. In §4.2, I argued that the only functional head that takes a proposition as its argument and returns an update is Force⁰. Since both the semantic and syntactic forms of clausal constituents are uniform, it is straightforward for embedding verbs to select them.

The remaining question, then, is how to represent the semantics of the embedding verb itself. It is clear enough what the meaning of a clausal update is in a matrix context, since it is passed to the pragmatic component where it updates the current discourse state. It is also clear that an update cannot apply to a lexical verb, so the reverse must be true; embedding verbs apply to their complement update. As such, a transitive embedding verb is of type $\langle rr, e, st \rangle$.

What is the practical effect of this semantic transformation? For one, it prevents the application of the update to the current discourse context. With embedded questions, “attitude verbs like *wonder* may be thought of as shifting the evaluation of their complement from the information and issues representing the discourse context to a body of information and issues representing the attitude subject’s doxastic state.” (Starr 2010:112).

The context shift is achieved by pairing individuals with preference states, notated R_a^w , to indicate that the state is assigned to the individual a in world w . Similar to how conversational backgrounds can represent different types of modality in the system of Kratzer (1991), these indexed preference states can represent different bodies of information pertinent to an individual. In the case of embedding verbs of communication — those which introduce what many descriptive grammars quite aptly call *indirect discourse* — R_a^w is a speaker-oriented discourse state, i.e. one which represents a discourse state in world w where a is the speaker at all worlds in $c_{R_a^w}$. I propose that embedding verbs of communication perform a similar shift, but rather than shifting from the current discourse state to an individual’s internal state, it shifts from the current discourse state to another discourse state.

With this interpretation of R_a^w , it is now possible to model a preliminary definition of embedding *say*¹² on Starr’s (2010) definition for *wonder*. Paraphrasing the formal definition, $[a \text{ wonders } \varphi]$ is true in the worlds where $c_{R_a^w}$ supports φ . Support, notated \models , holds if updating R with φ does not change R . When considering discourse states, the simplest case in which this is true is the circumstance in which φ has already been uttered in the discourse, so this is why using support is a good (although not completely airtight) test for whether a certain utterance has been made at a given stage of a discourse.

Thus I propose a preliminary definition of *say* for preference semantics in (21) below.¹³ As proposed, *say* is a function from updates and individuals to sets of worlds $\langle rr, e, st \rangle$ and returns the set of worlds which have a discourse state that is indexed to the speaker and supports the update denoted by the complement clause. This does not capture any of the eventive or agentive aspects of an act of saying, but only encodes the shift from the current discourse context to the indirect discourse context. The denoted proposition is the set of worlds in which the subject of *say* is the speaker in a context that supports φ .

(21) *Preliminary definition of say*

$\lambda\varphi\lambda x\lambda w . R_x^w[\varphi] = R_x^w$, where R_x^w is a speaker-oriented discourse state

Furthermore, since preference semantics as described by Starr (2010; 2012) is not a temporal semantics, this definition does not capture the distinction between *say/is saying/will say*, but an extension of the semantics where preference states can be indexed not just by worlds but by time/world pairs (t, w) could accomplish this.

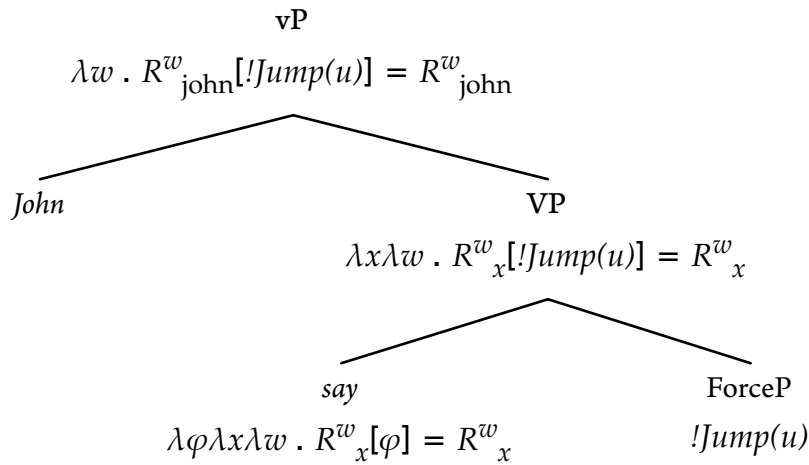
With a definition for embedding *say*, it is now possible to show how it can combine with an imperative.

¹²I do maintain that there is some homophony/polysemy of *say* in English, namely between clausal embedding *say*, which always takes an update as its complement, and direct quotation *say*. The latter can take any unit of uttered content as its complement, e.g. *John said, “I called Bill,”* or *John said “the”*. One possibility for unifying direct discourse complements is to treat them as nominalizations, patterning with *John said many interesting things*; this does not bear on the issue of clausal embedding, so I do not pursue it further here.

¹³This definition is informal insofar as it does not follow the logical syntax of Starr’s (2010) Logic of Mood (which does not make any claims about linguistic syntax). I present it in this format insofar as it is more perspicuous for demonstrating the composition of vP headed by *say*. (21) should still be compatible with a translation into the Logic of Mood.

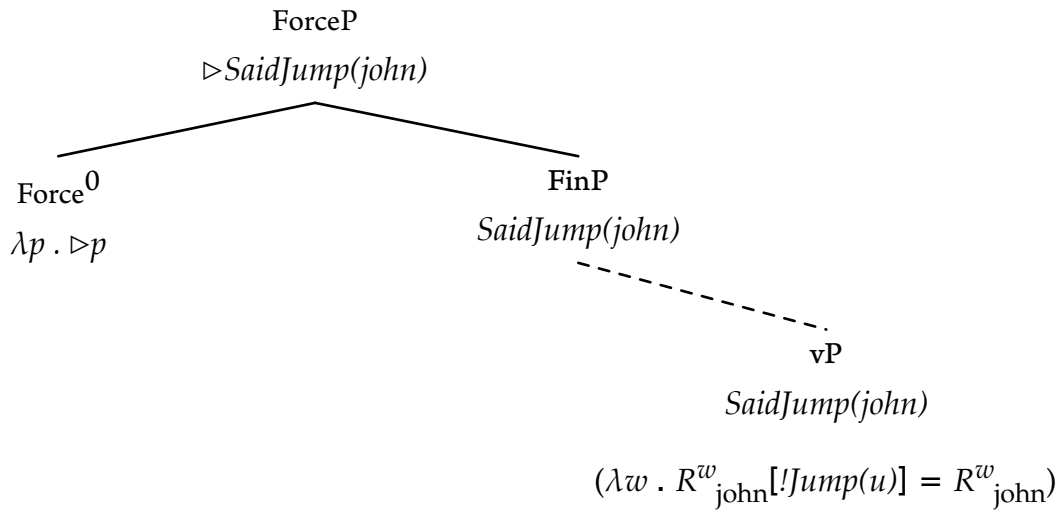
The declarative sentence *John said jump* is an embedding of the imperative *Jump!*, whose structure and meaning was shown in (12) above. Applying *say* to a clause and an individual gives the denotation of vP, the proposition $\lambda w . R_{john}^w [!Jump(u)] = R_{john}^w$. (22) shows the composition of this vP within the biclausal sentence *John said jump*.

(22) *John* [_{vP} *said jump*].



The proposition denoted by vP in (22) can be notated in the same manner as any proposition in preference semantics, as a property applied to a name, here *SaidJump(john)*. The assertion of this proposition is performed in the same manner that any clause is typed, by Force^0 .

(23) *John said jump.*



One final fact about embedded imperatives that deserves examination is the interpretation of their null subjects. Notice that in the representation in (22), there is no explicit link between u and either the current discourse context R or the shifted discourse context R^w_{john} . This is desirable, since u can be interpreted as the addressee of either context, as shown by the coherence of followup utterances that disambiguate its interpretation. This does not mean that its interpretation is unconstrained, since assigning it an interpretation that does not correspond to the addressee in either context is infelicitous (24c).

- (24) a. John said call him today. So I did.
 b. John said call him today. So you'd better do that.
 c. John was talking to Bill and said call him today. #So I did. / ✓So you should.

Thus preference semantics is capable of handling embedded imperatives without introducing additional complications. A single definition of embedding *say* can handle all types of clausal complements, and its definition can perform context-shifting by applying to preference states other than the current discourse state. Finally, it handles the ambiguity in interpretation of embedded imperative subjects in the ordinary course of the semantic derivation.

5.4 Summary

This chapter has demonstrated that preference semantics is a superior framework for representing imperatives compositionally. The semantics maps straightforwardly onto an articulated left-peripheral structure for imperatives and provides a unified type of meaning, updates $\langle rr \rangle$, for all clause types. There is no need for an imperative-specific position to derive imperative meaning. Like Force^0 specified for other values, imperative Force^0 takes a propositional complement and outputs an update; it is therefore of type $\langle st, rr \rangle$. As shown in Chapter 4, Force^0 is also present in embedded imperatives, so they too are of type $\langle rr \rangle$. Thus clausal structure and clausal meaning are the same at both the matrix and the subordinate level. Updates are either applied to the current discourse context or serve as an argument for an embedding verb. Following the unifying theme of preference semantics, all clausal embedding verbs can be unified under the semantic type $\langle rr, e, st \rangle$. Derivation and manipulation of illocutionary meaning is straightforward under the preference analysis.

CHAPTER 6

CONCLUSION

I have argued that a preference analysis of imperative constructions is superior for explaining their form, meaning, and use. What I have presented in the preceding chapters answers many of the big questions about imperative constructions while raising many smaller questions that merit further attention.

The decision to represent imperatives as preferences was motivated by the major shortcomings of the prior accounts of imperative semantics, the modal analysis (Schwager 2006; Kaufmann 2011) and the property analysis (Portner 2004a; 2007). The global preferences contributed by imperatives are of the form $\langle p, \neg p \rangle$, so they are distinct from content contributed by declaratives and interrogatives (which only add new preferences of the form $\langle p, \emptyset \rangle$) and have directly accessible propositional content (their first element, p). These dual semantic benefits, as discussed by Starr (2012), are reason enough to represent imperatives with preferences. Chapters 3 and 5 showed that representing imperatives as preferences provides further advantages at the interfaces with pragmatics and syntax.

In Chapter 3, I argued that representing the characteristic contribution of imperatives with preferences explains their distribution in discourse. I subjected imperative utterances to direct and indirect challenge tests, which diagnose at-issue and not-at-issue content, respectively. Since only propositions have at-issue status, the imposition of a new obligation with an imperative cannot be challenged in any way; it is illocutionary rather than propositional content. Imperatives diverge from performative declarative modals in these tests, because modal propositions expressing obligations are at-issue.

I also used the propositional content of imperatives to compute whether they are Relevant, a necessary condition for felicity. I concluded that if the propositional content of an imperative is a partial answer to the current Question Under Discussion, then it is Relevant. Imperatives are sensitive to different types of QUDs, because the form of the QUD determines its potential answers; any response must be congruent with the QUD (Roberts 1996). There are still open issues in the general theory of Relevance, which also apply to imperatives, including the issue of how to handle probabilistic answers to the QUD (see discus-

sion in Simons et al. 2011). Also, the interactions between imperatives and modal QUDs requires further study. A major step in this direction will be the completion of a full system of modality within preference semantics.

Chapter 4 argued for a syntactic model of the clausal left periphery that provides a clause-typing position (following Cheng 1991) compatible with attested word orders in imperatives, especially in English. I adapted and modified the articulated left periphery of Rizzi (1997) to account for several major clausal features: matrix vs. subordinate status, clause typing, information structure, and subject licensing. I demonstrated that the imperative verb must remain low in English imperatives, precluding an analysis of clause typing that requires either phrasal or head movement, while also demonstrating that a rich left-peripheral structure must be present in English imperatives to host fronted elements. I explained the differences between contrastive and non-contrastive topic fronting in English imperatives in terms of the location of features that drive their movement; [Focus] is encoded as an independent head, while [Top] is encoded on a portmanteau complementizer with [Sub] and [Force] features. I gave preliminary evidence that non-contrastive topic fronting in imperatives should be possible in languages which have an independent Topic⁰. Confirming the proposed model via crosslinguistic examination of similar interactions between clause type and information structure is an area for much further research.

Adopting the extended articulated left periphery for English also yielded new insights about the position of *do*-support in negative imperatives. The syntax of negative imperatives has long been studied (e.g Han 2000; Zanuttini 1997), but the new framework will allow negative imperatives to be explained in greater detail. English is often cited as being able to “directly negate” imperatives, but other languages use indirect strategies. Languages like Italian, Spanish, and Modern Greek require infinitive or subjunctive forms of the verb, while languages like Serbian, Welsh, and Latin require a dummy verb with imperative marking. I believe that the clausal hierarchy I have proposed can be used to explain the former in terms of intervention effects, and the latter by providing a dedicated position for the dummy verb (similar to English). Again, as much as there is syntactic variation in the world’s languages, there is room to apply the new model to them.

I have shown that the extended left periphery ought to be applied uniformly within a language, by examining how the structure of embedded imperatives mirrors that of matrix imperatives in English. Like matrix imperatives, they have an open Spec CP position and, in general, permit extraction. The same limitations of movement within matrix imperatives apply to embedded imperatives, blocking some elements from reaching the “escape hatch” position. Since these factors are what restrict extraction, imperatives do not pattern with either weak or strong islands, but have their own set of restrictions. There is a noticeable but subtle contrast between embedded imperatives (e.g. *John said call him*) and embedded infinitivals that are interpreted similarly (e.g. *John said to call him*). In the absence of negation, these constructions have extremely similar surface forms, leading to some confusion about their relative acceptability. Conducting quantitative research on the acceptability of these two constructions would provide a more solid basis for an explanation of their syntactic characteristics.

Finally, I showed in Chapter 5 that the preference analysis is compositional. The definition of illocutionary relation — a function which takes a proposition and a discourse state, and returns an updated, structured context (Murray 2010) — served as a model for the mapping of meaning to structure. Since the discourse state “argument” of an illocutionary relation is supplied pragmatically, the semantic content of a complete clause should be an update function from preference states to preference states $\langle rr \rangle$. Force operators, which perform clause typing, are thus of type $\langle st, rr \rangle$ and occupy Force^0 . The semantics of the surrounding heads, Sub^0 , Top^0 , and Focus^0 are such that they output an element of the same type as their input, but more can be said about their exact contribution. A full semantics of information structure is far beyond the imperative phenomena discussed here, but should be able to combine seamlessly with the preference analysis. Additionally, extensions of preference semantics itself will improve the analysis. In particular, a full system of nominal quantification within preference semantics will further explain imperative subjects, which are limited in the present system to names or the special constant u .

I also applied the compositional analysis to embedded imperatives, proposing a new definition of verbs that introduce indirect discourse, such as English *say*. Doing so requires that preference states can be indexed to individuals, with variable interpretation. In the case of indirect discourse, they are treated as

speaker-oriented discourse states. I proposed that *say* and similar verbs of communication are of type $\langle rr, e, st \rangle$, since their internal argument is a typed clause, which denotes an update. There are several improvements that can be made to the definitions of these verbs, including the addition of a component that captures the event and manner of communication; the current definition only specifies the shift from one context of interpretation to another. Furthermore, there is the open-ended question of what other phenomena in natural language can be expressed with indexed preference states. My expectation is that explaining imperatives is far from the only fruitful application of preference semantics.

The connection of imperative syntax, semantics, and pragmatics that I have presented is only possible in a preference analysis. The heart of the analysis is giving imperatives a unique semantic character while letting them interact directly with other types of meaning. Since preference semantics uses update rules that correspond to illocutionary relation, the semantics matches a syntactic theory that designates a clause-typing position. Because preference semantics is dynamic, it allows direct computation of pragmatic concepts such as Relevance. These tools allowed explanation of some long-standing problems regarding the form, meaning, and use of English imperatives. While there is much work still to be done on imperatives, especially outside of English, the most promising way to do it ought to be within the framework of the preference analysis.

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