Semantics & Pragmatics Volume 16, Article 7: 1–55, 2023
https://doi.org/10.3765/sp.16.7

Imperatives in dynamic pragmatics*

Craige Roberts
The Ohio State University

Submitted 2021-04-20 / First decision 2021-08-17 / Revision received 2022-05-03 / Second decision 2022-09-06 / Revision received 2023-03-13 / Third decision 2023-06-15 / Revision received 2023-09-06 / Accepted 2023-11-20 / Published 2023-11-29 / Final typesetting 2026-02-25

Abstract I offer a semantics and dynamic pragmatics for imperative grammatical mood. The semantic content of an imperative clause is its realization conditions. These take the form of a *de se* property, indexed to the addressee, which involves a circumstantial, futurate modal, interpreted relative to a contextually-given Kratzerian Modal Base and Ordering Source. Second person indexicality facilitates a novel account of the semantic contributions of overt imperative subjects, as in *nobody move!*.

* I am grateful to audiences at the MASZAT working group of the Research Institute for Linguistics of the Hungarian Academy of Sciences, Budapest, the Synners working group at OSU, the 2015 Amsterdam Colloquium, the EXPRESS Workshop on Non-Assertoric Speech Acts at ILLC/Amsterdam in February, 2021, the NYU Semantics Group, and a colloquium at the University of Stuttgart for discussion and critical comments. Thanks especially to Hans-Martin Gärtner, who offered crucial insight, and to Nate Charlow, Jordan Needle, Larry Horn, Frank Veltman, Daniel Harris, Matt Moss, and Lucas Champollion who offered very useful comments. I benefitted enormously from comments by Thony Gillies and two anonymous reviewers at S&P, as well as from critical comments by Rich Thomason. But most important, I acknowledge my debt to the excellent, pioneering work on imperatives of Paul Portner, Magdalena Kaufmann, Nate Charlow, Cleo Condoravdi and Sven Lauer, and W. Starr; I hope I have done it justice. The first part of this work was conducted while I was a Senior Fellow in 2014-15 at the Institute for Advanced Studies at Central European University, Budapest, Hungary, sponsored by Budapesti Közép-Európai Egyetem Alaptvány. The theses promoted herein are the author's own, and do not necessarily reflect the opinion of the CEU IAS. I am deeply grateful for their support, as well as to The Ohio State University, which also helped to make possible that fellowship year. The work herein was partly conducted under an NSF collaborative research grant (#1452674 to OSU) awarded to the author, David Beaver, Mandy Simons and Judith Tonhauser: "What's the question: A cross-linguistic investigation into compositional and pragmatic constraints on the question under discussion". The paper is dedicated to the memory of my teacher Emmon Bach. As Emmon taught (class lectures, UMass/Amherst, mid-1980s): "With lambdas you can build the Brooklyn Bridge." Indeed.

The often-attested deontic flavor of imperative modality is not semantic, nor is directive force itself. Rather, these arise from the canonical pragmatic role of imperatives: updating a distinguished body of shared information G in the context of utterance. Unlike the Common Ground—consisting of propositions which the interlocutors (purport to) believe, and the QUD—the questions which they are committed to resolving, G consists of the publicly evident goals of the interlocutors, organized to reflect their plans and priorities. G is updated by and influences the understood meaning$_{nn}$ of an imperative utterance, including how its Modal Base and Ordering Source are derived.

Thus, the account shares central features with the most prominent formal theories of imperative semantics (especially Charlow's use of plans, Kaufmann's modality, and Portner's dynamic pragmatics), but affords superior empirical adequacy and differs from all in the way that it distinguishes semantic from pragmatic features of imperative utterances. I also argue that this approach is conceptually superior, helping to capture long-observed intuitions about the relations between indicative, interrogative and imperative moods, and their relations to the attitudes of the agents who wield them.

Keywords: imperatives, deontic modality, domain restriction, dynamic pragmatics, free choice, disjunction

Introduction

There are three central types of speech acts, observed in all human linguistic discourse. An assertion proffers a proposition for addition to the interlocutors' shared information. A question poses an issue for discussion. A direction typically proposes that the addressee(s) behave in some fashion. Correspondingly, in all languages we find three different grammatical moods which are canonically used to issue such speech acts: the declarative, interrogative, and imperative, respectively. Following Hausser 1980, Ginzburg & Sag 2001 and Portner 2004, 2007, 2018b, these canonical uses of the grammatical moods are reflected in differences in the semantic types of the sentences in which they occur. Declarative sentences denote propositions (functions from possible worlds to truth values, type $\langle s,t\rangle$); interrogatives denote sets of propositions (the possible answers to the question, type $\langle\langle s,t\rangle,t\rangle$); and imperatives denote properties indexed to the addressee(s), type $\langle s,\langle e,t\rangle\rangle$. The Force Linking Principle of Portner 2004 and Zanuttini, Pak & Portner 2012 tells us that there is a default correlation between

these semantic types and the speech acts that sentences in these moods are canonically used to issue.

That this correlation is natural, in view of the pragmatics of the corresponding speech acts, is obvious in the case of the declarative and interrogative. What about the imperative, used to issue a direction? Illocutionary effects pertain to mental attitudes on the part of the interlocutors: purported belief in the case of assertion, a commitment to inquiry in the case of questions. A direction is a proposal to the addressee to adopt a plan to act in such a way as to realize the semantic content of the imperative used to issue the direction. To do so is to display an intention; an intention is a mental attitude, one not reducible to belief and/or desire (Bratman 1987). Such an attitude is not a *propositional* attitude. One does not intend a proposition; the objects of intentions are not units of information. As Charlow (2011) puts it, "Imperatives tell agents how to plan, rather than what to believe." Like the plans of which intentions are part, this mental state involves "an appropriate sort of commitment to action" (Bratman 1987: 29). One intends to do *something*, which we can model as intending to realize a property. Moreover, one can only have an intention *de se*: one intends that one's own self come to have the relevant property. In the case of a direction posed with an imperative utterance, the proposed *de se* intention is to self-realize the property denoted by the imperative's VP.

Imperatives are a sub-type of jussive sentences (Zanuttini, Pak & Portner 2012); in some languages, jussives may be targeted not to the addressee of the utterance, but to the speaker, as promises, or the join of the speaker and the addressee, as exhortatives. Note that in all these cases, the target is an interlocutor, so that jussives are all essentially indexical. And in all cases, the speech act canonically associated with a jussive involves an intention: If anchored to the 1st person, a Korean jussive promissive involves a commitment on the part of the speaker to intend *de se* to realize the property denoted by the VP, while an exhortative proposes that the interlocutors jointly adopt such an intention ('let's go!').

Here we will focus on the imperative in English, with the expectation that this account characterizes its semantics in those languages in which an imperative is targeted solely to the addressee, and can be generalized to account for jussives more broadly. I offer a truth-conditional semantics and a pragmatics in the framework for dynamic pragmatics in the vein of Roberts 1996, 2012a, 2017, 2018, 2023 and Portner 2004, 2018b,a. This proposed account has the empirical virtues of several of the best previous accounts of imperative semantics, in particular those of Portner (2004, 2007, 2011); Schwager (2006) and Kaufmann

(2012), and in fact borrows features from those accounts while avoiding problems that arise in them and in others in the literature.

The semantic content of an imperative consists of realization conditions: the *de se* property that the targeted addressee would come to have were she to realize the proposed direction under the applicable conditions. As suggested by this paraphrase, the semantics is modal, conditional, and futurate. But other aspects of the account are essentially pragmatic: A central feature of the attested meaning of an imperative utterance — its apparent deontic flavor — is given not by its compositional, syntactico-semantic content, but instead arises from the interaction between that content and the pragmatics of its canonical use to issue a direction.

I begin in Section 1 by drawing on other recent work on imperatives to develop desiderata for a theory of imperative mood, thereby establishing benchmarks for the theory to be developed. In Section 2, after introducing the dynamic pragmatic framework, I offer a basic formal semantics for imperative-type clauses and the pragmatics of their default use as directions. In Section 3, I show how this account satisfies the desiderata from Section 1. In Section 4, I consider imperative clauses with overt subjects, modifying the formal semantics to reflect how these subjects contribute to the realization conditions. In Section 5, I compare this account with others in the literature. And in Section 6, I offer conclusions and prospects.

1 Desiderata for a theory of imperative mood

Two of the most influential contemporary theories of the semantics and pragmatics of imperatives are those developed by Kaufmann (in Schwager 2006, Kaufmann 2012) and Portner (2004, 2007, 2017).[1] The central theses they adopt are summarized in Table 1:

1 Below we'll discuss the important contributions of Charlow (2011, 2014, 2018), and others. For background on clause type, mood, and illocutionary force, see Portner's excellent *Mood* (2018b), especially the masterful exposition of the literature in Chapter 3: Sentence Mood, and his Section 3.3.3: pp.199-220 on imperatives. I have tried to respect his terminology and the careful distinctions he makes. Kaufmann 2021 is an excellent critical overview of the literature on imperatives.

	I	II	III	IV	V
Features: **Accounts:**	illocutionary force in semantic LF	semantic type of imperatives	modal in semantic content	flavor of semantic modality	uses dynamic pragmatics
Kaufmann (Schwager 2006, Kaufmann 2012)	no	*proposition*	yes	*semantic deontic*	*no*
Portner (2004, 2007, 2018b, 2018a)	no	indexed property	*no*	pragmatic deontic	yes
***Failure* to satisfy the associated desiderata**		a) not true/false; b) no evaluative adjectives; c) cannot be conditional antecedents; d) non-assertive	e) conditional imperatives; f) range of modal flavors	g) scope of deontic relative to negation at LF; h) futurate flavor	i) deontic parallels + missed explanatory potential

Table 1 Comparison of two prominent theories of imperative semantics and pragmatics

In this section, we'll go through a number of features of English imperatives, common across languages, which serve as desiderata for an empirically adequate account, and consider how Kaufmann's and Portner's theories measure up, using Table 1 as a scoreboard. In the last row of the table are listed those desiderata which are problematic for some features of the theories above, as will be discussed below.

Neither Kaufmann nor Portner take imperatives to have their default illocutionary force — their use to issue directions — built into their semantic content and so present at LF, as reflected in Column I of the table. Both assume that the default use of a root imperative is directive, but that capturing this is a matter for pragmatics. In contrast, Krifka (2014, 2024), like many before him (see Section 5 below), argues for the presence of an illocutionary force operator in logical form.

There are many empirical problems with assuming that imperative mood itself has illocutionary force. One central issue is that like clauses in other

grammatical moods, imperatives may occur embedded,[2] and in that case they do not have their own illocutionary force. For example, in English an imperative clause can occur as the complement of a verb of saying, though always directed to the actual addressee. Uttering (1) does not contribute a directive to the addressee to eat John's share of the chicken:

(1) John$_i$ said eat his$_i$ share of the chicken. He won't get home til late.

In (1) the third person *his*, coreferential with the subject *John*, precludes a direct quotation interpretation. In some languages, complement imperatives may have a shifted target, not the actual addressee but the agent of the embedding attitude (Zanuttini, Pak & Portner 2012).

Similarly, disjunction always takes narrow scope relative to illocutionary force, across all grammatical moods:[3]

(2) Mary is happy or John is sad.
Can't mean: either I assert that Mary is happy or I assert that John is sad.

(3) Do you want coffee or do you prefer tea?
Can't mean: either I ask whether you want coffee or I ask whether you prefer tea.

(4) My advice to you is: Keep together. Either everybody stay or everybody leave! [Mastop 2005]
Can't mean: either I advise you all to stay or I advise you all to leave.

In (4), the speaker clearly enjoins one goal upon the (group) addressee: keep together. She then proposes two ways in which this can be achieved — two kinds of intentions the group might adopt to realize the proposed goal: either the group all staying or the group all leaving, proposing (in a single imperative) that they adopt one plan or the other.

More generally, embedded uses of clauses in imperative (or declarative or interrogative) mood are not speech acts, have no independent illocutionary force. So illocutionary force is not triggered by grammatical mood alone.

Take an *utterance* to be an ordered pair of a linguistic constituent (under syntactic analysis) and a context of utterance (Bar-Hillel 1971). Then only utterances whose content is understood to be that of maximal root clauses may have illocutionary force. (See Roberts 2018 for more discussion and argument.)

2 See the references cited in Portner 2017.

3 Starr (2020) offers prima facie counterexamples to this claim. We'll discuss those in Section 5.

Representing directive illocutionary force in the LF of root imperative clauses is problematic for several reasons. For one thing, there's a many-to-one mapping between sentence mood and speech act type, in both directions: Zanuttini & Portner (2003) show that there are multiple means of formally marking clausal mood even within a single language (e.g., Greek, Italian). It isn't possible to identify any single morphosyntactic element(s) as identifying force. And the same morphological form may be used in different moods (Kaufmann & Poschmann 2013); e.g., colloquial German allows *wh*-interrogatives with imperative morphology and associated directive meaning.

Even when the imperative clause type is unambiguously given morphosyntactically, there is no determinate correspondence between the clause-type of an utterance and the illocutionary force we understand its utterance to have: Utterances may involve evidently insincere uses of the utterance content; and a particular clause-type can be used to make a different kind of speech act than it canonically makes. Rising intonation may yield a marked interpretation of an imperative clause, as in (5B), where B doesn't so much propose that A ask her mother as tentatively suggest she entertain taking that action, implicating a question about whether to do this.[4]

(5) A: I don't know what to do!
B: Ask your mother↑

And we see something similar with falling intonation in questions:

(6) [Context: A and B both know that A has no money to spend on non-essential items.]
A: I'm really tempted to buy this coat. It's on sale!
B: Does it fit in your budget ↓

A rhetorical question may constitute a reminder. Speaker B in (6) isn't proposing that the question that's the semantic content of her utterance be addressed, but rather using the question to remind the addressee about the answer in their common ground. The falling intonation (though not necessary) can be used to indicate the speaker's commitment to the question's resolution: the answer is entailed by the previous discussion of the budget.

4 Both Malamud & Stephenson 2015 and Rudin 2018 take rising intonation (on declaratives and imperatives, respectively) to indicate a lack of speaker commitment, affecting the speech act the speaker is understood to intend by their utterance. Both realize this pragmatically in the framework of Farkas & Bruce 2010.

In general, there's no way of determining whether the content of an utterance is asserted/asked/suggested without considering contextual factors like the question under discussion. Sometimes a root clause by itself has no illocutionary force, instead constituting a fragmentary answer, such that only the entire content retrieved has illocutionary force, as we see in (7) and (8).

(7) A: What did John hear on Fox News?
B: The Democrats have stolen the election—there's widespread fraud.

(8) [Context: A recently took a message from B's landlord, Mrs. Johnson:]
A: What are Mrs. Johnson's demands?
B: Pay your rent by Monday, and keep your bicycle out of the hallway.

In neither the declarative (7B) nor the imperatives in (8B) does the content of the root clause uttered by itself constitute an assertion or a direction, though in other contexts that is how we would understand them. Here, in order to address the questions posed by A, we take these contents to be those of an assertion made on Fox News (7) or of a direction posed by Mrs. Johnson (8).[5] So in these contexts, neither the declarative clause nor the imperatives have their own illocutionary force. And it is only relevance to the question that tells us that.

Thus, even if we ignore embedded imperatives, the data argue that imperative grammatical mood is neither sufficient nor necessary to indicate that a given utterance is meant to be understood as a direction. Arguably, the consistent determinants of illocutionary force are contextual factors.

Accounts which put force in LF appear to make the wrong predictions on all these counts.

Conclusion: Illocutionary force has no place in semantic content, none in Logical Form.

Further desiderata for a semantics and pragmatics of imperative utterances:

In other columns in Table 1, we see that Kaufmann's and Portner's theories make different predictions, with resulting failures to meet some of the following desiderata for a semantics and pragmatics of imperative utterances.

5 Again, in (8) use of *your* precludes understanding B as a direct report of what the landlady said.

For example, in Column II, we see that Kaufmann takes imperatives to denote propositions, while Portner takes them to denote properties indexed to the addressee. Consider (a):

a) Imperatives are not felicitously subject to judgments of truth or falsity, unlike asserted declaratives.

(9) A: How do I get to Harlem?
B: Take the A-train.
C_1:#That's false!
C_2: No, take the M4 bus.

As a response to (9B), (9C_1) is infelicitous. The felicitous (9C_2) is not a truth value judgment, but a rejection of B's directions, followed by a different proposed answer to A's question. This looks like a problem for Kaufmann, but she addresses it by claiming that imperative statements are *performative assertions*, a type of assertion not subject to truth evaluation. However:

b) Unlike performatives (10) or deontic modal statements (11), imperatives cannot occur with evaluative sentential adverbials (12):

(10) Unfortunately, I now pronounce you man and wife.

(11) Unfortunately, you must go to bed!

(12) #Unfortunately, go to bed!

This observation was initially due to Gärtner (2017), who didn't restrict the constraint to the evaluatives. But Matt Moss (p.c.) pointed out the acceptability of the following:

(13) [to a friend who's considering not taking his meds:] Obviously, take them!

Ernst (2000) classifies *obviously* as an evidential (epistemic modal) speaker-oriented adverb, whereas *unfortunately* in (10)–(12) is an evaluative speaker-oriented adverb. I find Ernst's other evidential adverbs to be acceptable with imperatives, as well: *clearly*, *plainly* can acceptably replace *obviously* in (13). Other evaluatives (*luckily*, *oddly*, *significantly*, *unbelievably*) and Ernst's discourse-oriented adverbs (*frankly*, *honestly*) are, for me, as unacceptable as *unfortunately*. Hence, Gärtner's generalization seems a bit too broad. But all the evaluatives and discourse-oriented adverbs are acceptable with performatives and deontic modal statements (the counterparts of (10) and (11), but unacceptable with imperatives.

Hence, Kaufmann's claim that imperatives are performative deontic statements does not account for desideratum (b).

And there are other ways in which imperative clauses differ from declaratives, even deontic declaratives:

c) Imperatives cannot occur in the antecedent of a conditional, as illustrated in (14a), in contrast to the deontic declaratives in (14b):

(14) a. */! If eat your vegetables, then you can't have dessert til you do.
b. If you have to eat your vegetables, then you can't have dessert til you do.

(14a) is ungrammatical or semantically anomalous, or — most likely — both.

d) Across languages, when imperative mood occurs in root clauses they strongly tend to be used with directive illocutionary force, just as declaratives tend to be used to make assertions, interrogatives to pose questions. This directive force has consequences for felicity, and leads to differences from deontic modal declarative statements. Consider Portner's (2017) contrast:

(15) You should not park in the dry cleaner's lot, because you'll get a ticket if you do. So,…
a. do not park in the dry cleaner's lot!
b. ??you should not park in the dry cleaner's lot!

(15a) contributes new content to the interchange, while at best (15b) sounds redundant, and odd because so suggests that what follows will be an informative conclusion.

I think this same difference results in the following contrast:

(16) You shouldn't park in the dry cleaner's lot, because you'll get a ticket if you do. But who cares — it's just a ticket and you're in hurry. So,…
a. park in the dry cleaner's lot!
b. #you should park in the dry cleaner's lot!

The imperative in (16a) contributes advice to the targeted addressee willing to accept the consequences of disregarding her legal obligations. But (16b) sounds odd, presumably because once the law-based ordering source has been evoked for *shouldn't p* in the first clause (Kratzer 1981), it seems inconsistent

to immediately ignore it in order to conclude *should p*, and there is no other salient set of mores to restrict its domain.

Desiderata (a)–(d) are problems for Kaufmann's proposition-type account. They favor Portner's property-type approach.

Column III in Table 1 shows another important difference between Kaufmann's and Portner's theories: Kaufmann takes the semantic content of an imperative clause to contain a modal, assuming a Kratzer-style account of natural language modality, with a presupposed modal base f and ordering source g contextually retrieving conditional domain restriction. But Portner has no modality in the semantic content, the attested deontic flavor instead arising from his pragmatics of directive illocutionary force: adding the property denoted by the imperative to the addressee's To Do list in the context of utterance. So both theories give imperatives deontic modal flavor, but derive it very differently. The next two desiderata bear on these assumptions:

e) Imperatives may be explicitly or implicitly conditional:

(17) If you're hungry, have some cheese and crackers.

(18) [Army combat instructor to students:]
Before you walk into an area where there are lots of high trees, if there might be snipers hiding in the branches, use your flamethrowers to clear away the foliage. [after Egan, Hawthorne & Weatherson 2005]

(19) [two crooks planning a robbery:]
A: What should I do if the cops arrive?
B: Start shooting.
modal subordination interpretation: 'if the cops arrive, start shooting'

Since Portner's imperative semantics has no modal, he cannot adopt a Kratzerian story about conditional imperatives, which Kaufmann develops. The next desideratum points to the same problem for Portner.

f) Imperatives display a range of flavors, with two main types (Kaufmann's (2012) terminology), the Practical and the Expressive uses:

Practical: something the target can do. Only felicitous if it can be assumed that it's possible for the target to realize the property denoted by the VP. The many sub-types include:

commands and prohibitions

(20) Boss [to tardy employee]: Tomorrow get to work on time!

(21) And don't dawdle!

permission

(22) Take your time!

(23) Have a cookie.

suggestions

(24) [To a friend who's been ill:] Take a day off to recuperate, why don't you?

pleas: (24) above, or *Please help me!*

advice: speaker may be disinterested

(25) [Two friends chatting:]
A: I'm worried that this contractor will put a lien on my property. But the guy's completely unreasonable. I can't talk to him.
B: Hire an attorney.

instructions/directions

(26) A: How do I get to Harlem?
B: Take the A-train.

(27) To prepare an artichoke, pull out the central leaves and the fuzzy part down to the heart.

warnings

(28) Be careful! There are sharks in the water!

concessives

(29) OK, go to the silly party! See if I care.

Expressive: nothing can be done; either the matter is already settled, or the target isn't in a position to do anything about it. Grounded in the wishes, hopes, etc. of the speaker.

well-wishes

(30) Enjoy the movie! (Kaufmann 2012)

hopes:

(31) [In the short story "The lady or the tiger", a captive must choose one of two doors, knowing that behind one is a beautiful lady, behind the other a vicious tiger. He prays silently before opening one of the doors:]
Be the lady! [Carl Pollard, p.c.]

Note that expressives like (30) aren't deontic in import. They are instead buletic, pertaining to the speaker's preferences and priorities. Hence, expressives are not used to issue directives. I will assume that these uses of the imperative are optative in mood, rather than directive. A number of languages are said to have a morphological optative mood, including ancient Greek, Albanian, Armenian, Georgian, Turkish, and Yup'ik, among others. Since English does not, it uses imperative as one way of expressing wishes. I will not address this use of the imperative in what follows.

Positing a modal associated with the imperative, Kaufmann uses different combinations of types of Kratzerian modal bases and ordering sources to elegantly account for the different flavors of the imperative just illustrated.

Desiderata (e) and (f) are problems for Portner's account, which cannot use the Kratzerian parameters *f* and *g* for modal interpretation. They favor Kaufmann's assumption of semantic modality in imperatives.

So it seems that imperatives have semantic modal force. But other data argue that the deontic flavor is not itself semantic, as assumed by Kaufmann, bearing on the difference in Column IV of Table 1:

g) The deontic force of an imperative cannot occur under the scope (syntactic or semantic) of negation:

(32) a. Don't go out!
can't mean: 'there's no obligation to go out'
Instead, constitutes a direction to not go out.

b. You needn't go out.
'it's not the case that you are obliged to go out'

If there were a deontic modal in the semantic content of an imperative, we would expect that it could occur under the scope of negation, like need in (32b).

h) Imperatives display evidence of temporal reference, always pertaining to a present or future time:

(33) Relax!

(34) Please have this done by the time I get back.

(35) a. Vote tomorrow!
b. #Please vote by last night!

Several authors (including Katz & Postal (1964: 74–79), Arbini (1969), Huddleston (1970)) have noted that when a tag is added to an English imperative, one uses the future form *will*. And von Fintel & Iatridou (2017) note that in rejecting an imperative, one also uses futurate *will*, as illustrated in their examples:

(36) a. Take out the garbage, will you?
b. Take out the garbage, won't you?
c. A: Take out the garbage!
B: No, I won't.

Desiderata (g) and (h) argue that the semantic modal flavor of an imperative is not deontic.

Finally, for the Practical imperatives, Portner does seem to make the right predictions using a dynamic pragmatics, which has important explanatory potential in other respects:

i) Practical imperatives are closely related to deontic modal statements, in that they:

- permit one to infer their deontic modal counterparts, as in the following pairs:

(37) [father to son:] Finish your homework before you surf the web.
You must finish your homework before you surf the web.

(38) [to a friend in trouble:] Hire an attorney.
You should hire an attorney.

Of course, (37) is a command, while (38) is more like a helpful suggestion. Accordingly, *should* in (38) is a weak modal, since the directive does not imply that the addressee is necessarily under an obligation to hire an attorney.[6] Rather, as Silk (2022) puts it, "weak necessity modals afford a means of entertaining and planning for hypothetical extensions of the context in which certain considerations (norms, values, etc.) apply", without committing to these considerations actually obtaining, and hence without necessitating the modal's prejacent in the actual world.

- display constraints on interpretation of sequences of imperatives parallel to those on sequences of modal statements (Portner 2004, his (27), modified (28)):[7]

(39) a. Be there at least two hours early.
b. Then, have a bite to eat. [odd as permission after the order in (a)]

(40) a. You must be there at least two hours early.
b. Then have a bite to eat at that cute little place on the corner. [odd as suggestion after the moral injunction in (a)]

- display a variety of other deontic-like behaviors, including a Deontic Moore's Paradox, and "Free Choice Disjunction", a counterpart of "Ross's Paradox" (1941).

Desideratum (i) argues that practical imperative directions do have a deontic flavor, and suggests that deriving this pragmatically, as Portner does, may be useful.

Portner's pragmatics also offers a range of other explanatory benefits; e.g., some of the pragmatic principles governing imperative felicity that Kaufmann must stipulate simply fall out from the general nature of dynamic pragmatics in a language game; see Roberts 2018: Section 12.4.

6 On weak deontic modals of necessity, see von Fintel & Iatridou 2008, Silk 2022 and further references therein. (60) below is a concrete example of how weak modal interpretations of imperatives are derived.

7 One reviewer doesn't share these intuitions. However, I agree with Portner that the tone in (b) of each is odd, and in the same way after both imperative and modal (a)s.

In the next section, I'll present a theory which borrows the best features of each of these two accounts to satisfy these desiderata, and more besides.

There is one more feature of English imperatives to note before we continue, one noted by both Kaufmann and Portner, as well as by Charlow (2011), though only Kaufmann and Charlow treat it in detail: Imperative clauses may have overt subjects, which may be 3rd person and even quantificational. Here are typical examples:

(41) Everyone pick up their/your toys before naptime!

(42) Nobody move! [Veltman 2018]

This sort of data would seem *prima facie* to be a problem for the property-denotation approach to imperatives, like that of Portner. But imperative subjects offer challenges for the proposition-denotation approach as well, as discussed by Charlow (2011, 2018) and Kaufmann (2012). We'll postpone discussion of the full range of imperative subjects till Section 4.

2 A theory of the semantics and pragmatics of imperatives

The basic intuition upon which the present proposal is based is that in issuing a direction to an addressee by uttering an imperative sentence, the speaker proposes to the addressee that they adopt an intention to realize the property denoted by the VP in any of the applicable circumstances.

I will offer a formal semantics and pragmatics of imperatives that aims to capture the following hypotheses:

(i) Imperatives denote properties indexically targeted (in English) to the addressee, as in Portner's account.

(ii) Instead of truth conditions, imperative clauses have realization conditions, spelling out what the world would have to come to be like for the property to count as realized, in the applicable circumstance(s), by the addressee to which it's directed.

(iii) Semantically, imperatives have Kratzerian modal force, as in Kaufmann's theory; thus, they are inherently conditional, depending upon a modal base f and ordering source g.

(iv) The modal flavor of an imperative is presupposed to be futurate and circumstantial (not deontic); a modal base f and ordering source g deter-

mine the applicable circumstances in which the property is to be realized, modeled as a set of accessible world/times, where the time is future with respect to the time of issuance of the directive.

(v) The illocutionary force of an imperative is pragmatically determined, not represented at LF.

(vi) The default use of imperatives (as indicated by context) is as directions, proposals for addition to an independently motivated aspect of dynamic pragmatic context: the record of the addressee's evident goals, plans, and preferences.

(vii) Practical directions, given (vi), pragmatically convey deontic force: acceptance involves a public commitment to achieving a goal; moreover, a goal is teleological, something to aim at (and hence, in this respect, like an element on Portner's ToDo list).

2.1 Basic analysis of imperatives

2.1.1 The notion of context

In any account in which pragmatics plays an explanatory role, we need a well-defined notion of context of utterance. Elaborating slightly on Roberts 1996, I formalize the context of utterance as an idealized scoreboard for a language game, a tuple of bodies of information:

The *scoreboard* K *for a language game* at time t is a tuple, $\langle$I, M, $\prec$, CG, QUD, G$\rangle$, where:

I is the set of interlocutors at t.
M is the set of illocutionary moves made by interlocutors up to t, with distinguished sub-sets:

A $\subseteq$ M, the set of assertions
Q $\subseteq$ M, the set of questions
D $\subseteq$ M, the set of directions
Acc $\subseteq$ M, the set of accepted moves

$\prec$ is a total order on M, the order of utterance.
CG, the common ground, is the set of propositions treated as if commonly understood to be true by all $i \in$ I at t.

For all $a \in$ A $\cap$ Acc, $a \in$ CG.
CG reflects all information about the current state of play in the scoreboard K itself.

QUD $\subseteq$ Q $\cap$ Acc, the ordered set of questions under discussion at t, is such that for all $m \in$ M at t:

a. for all $q \in$ Q $\cap$ Acc, $q \in$ QUD(m) iff CG fails to entail an answer to q and q has not been determined to be practically unanswerable.
b. QUD is (totally) ordered by $\prec$.
c. for all q, $q' \in$ QUD, if $q \prec q'$, then the complete answer to q' contextually entails a partial answer to q.
d. for all $q \in$ QUD there is a $g \in \mathrm{G}_{\mathrm{com}}$ (see below) such that g is the goal of answering Q.

G is a set of sets of goals in effect at t, such that

for all $i \in$ I, there is a (possibly empty) G_i which is the set of i's evident goals, including those which i is publicly committed at t to trying to realize; and

$\mathrm{G} = \{\mathrm{G}_i \mid i \in \mathrm{I}\}$.

For all $d \in$ D $\cap$ Acc, d indexed to interlocutor i, there is a goal g of realizing d such that $g \in \mathrm{G}_i$ iff the applicable conditions for i's realization of d may yet arise and it has not been determined that the realization of d by i is impracticable.

Moreover, for all $i \in$ I:

a. for all $g \in \mathrm{G}_i$, g is a conditional goal, its presence in G_i representing i's intention to achieve the goal should certain conditions obtain in the actual world at some (future time) $t' > t$.
b. i's priorities are reflected in additional structure(s) over G_i: Some goals sub-serve others, some goals are hierarchically organized into plans, and the way that the agent i prioritizes her goals is reflected in a partial order.

and we can define:

$\mathrm{G}_{\mathrm{com}} = \{g \mid \forall i \in \mathrm{I} : g \in \mathrm{G}_i\}$, the set of the interlocutors' common goals and plans at t.

$\mathrm{G}_{\mathrm{Q}} = \{g \in \mathrm{G}_{\mathrm{com}} \mid$ there is some Q $\in$ QUD and g is the goal of answering Q$\}$.

The central elements of the scoreboard are the common ground CG, the set of questions under discussion QUD, and G, representing the interlocutors' evident goals and plans, organized to reflect their preferences and priorities. G will be especially important for the pragmatics of imperatives. G contains an organized

set of goals for each interlocutor. Crucially, these goals are conditional. A teacher who tells you to finish your homework doesn't typically expect you to do so come what may, but only if you can do it without harm to yourself or others: It is understood that staying alive and doing no harm are higher priorities than learning and pleasing a teacher.

Goals and plans are reflected in an agent's intentions, and these, in turn, involve commitments. As Bratman (1987) spells out, commitments tend to endure and to be hierarchically organized. Some goals subserve others: In particular, plans are hierarchically organized with an over-arching goal (finishing this paper), subgoals crucial to achieving it (finishing this section of the paper), etc. There are many constraints on what it means for an agent to rationally intend to achieve a given goal, or a set of goals; see Bratman and work on planning theory in artificial intelligence, the discussion of the relationship between CG and ToDo lists in Portner 2007, and the discussion of goals and plans in Charlow 2011. Among other things, the goals in G must be in principle possible for the agent to achieve at some time in the future, and consistent with each other.[8] I assume that such constraints obtain on G and its sub-parts.

Interlocutors may share common goals and plans. By this, I mean goals and plans with the same outcome in the world, bringing it about that a given situation obtain, be it that a given question under discussion is satisfactorily addressed (a shared discourse goal in G_Q) or that they bring about a particular state of affairs in the world (a common domain goal), like building a house for their new dog.

As in my earlier work, I define:

(43) RELEVANCE: Since the QUD reflects the interlocutors' publicly evident discourse goals at any point in a discourse, in order for an utterance to be rationally cooperative it must address the QUD.

(44) An utterance *m addresses a question q* iff *m* either contextually entails a partial answer to *q* (*m* is an assertion) or is part of a strategy to answer *q* (*m* is an interrogation) or suggests an action to the addressee which, if carried out, will presumably help to resolve *q* (*m* is a direction).

If you ask me *where are my socks?* and I reply *look under the bed*, my directive response is RELEVANT if I have reason to believe that its realization by you will

8 Rich Thomason (p.c.) points out that the aggregation problem in utility theory argues that this is much harder than I make it sound here, and not infrequently impossible. This very general problem goes beyond the discussion here.

help to resolve the question. In (9) from above, responses (9B) and (9D) are RELEVANT to the QUD denoted by (9A) because a *how* question is one about achieving a particular goal, here getting to Harlem.

(9) A: How do I get to Harlem?
B: Take the A-train.
C: #That's false!
D: No, take the M4 bus.

So RELEVANCE here leads us to understand the directive response to involve a tacit purpose clause: 'to get to Harlem, take the A-train/M4 bus'. Thus, either answer purportedly constitutes a recipe for achieving the queried goal. RELEVANCE implies that if one carries out this recipe one will get to Harlem, achieving one's domain goal, and therefore know the answer to the question.

2.1.2 The formal semantics

Against this background we develop a semantics for the imperative.

We want to define the property that the target of a directive, the addressee, is enjoined to endeavor to realize, a property based on the denotation of the imperative's prejacent. When an imperative is used to issue a directive, the acceptance of this enjoinder is what lends its content deontic force. In accepting it, the agent adds to her goals the goal of *coming to realize the prejacent property in a timely fashion in the applicable circumstances*. The semantic content of the imperative itself amounts to a description of what is to be realized: its realization conditions. Just as in classical compositional semantics an indicative simply denotes a set of possible worlds, and an interrogative denotes a set of sets of possible worlds, neither encoding the illocutionary force of assertion (adding to the Common Ground, with concurrent commitments for consistency and entailment) or interrogation (adding to the QUD, with concurrent obligations to direct conversation accordingly), so an imperative simply denotes the property to be realized by the targeted addressee, and not the deontic force of a directive, involving a commitment to the realization of its prejacent.

Like goals themselves, imperatives are conditional, the prejacent only to be realized when certain circumstances obtain. We'll use Kratzer's modal base and ordering source to contextually retrieve the non-past applicable circumstances in which the target addressee is enjoined to realize the property denoted by the imperative clause.

The following definitions prepare the ground for the semantics:

(45) A *circumstance* is a world/time pair $\langle w, t\rangle$.

(46) A *proposition* is a set of circumstances.

(47) SAMEHISTORY(w', w, t) is true just in case world w' is exactly the same as world w in all matters of particular fact up to time t.

(48) For worlds w, w', times t, t': FUT$(\langle w, t\rangle) =$
$\{\langle w', t'\rangle \mid$ SAMEHISTORY(w, w', t) & $t \prec t'\}$

(49) For a given agent x_i, *a goal$_i$-based ordering source* g is a function that takes a circumstance $\langle w, t\rangle$ and yields an ordered set of propositions G reflecting x_i's hierarchically organized goals and intentions in $\langle w, t\rangle$.[9]

Note that the future circumstances of $\langle w, t\rangle$ aren't necessarily in the same world. In a sense, they are the possible futures.

We want to restrict the future circumstances at which realization of the prejacent is applicable to those circumstances in which its realization is timely — favorable or useful with respect to certain goals:

(50) *Timely$_g$ future circumstances.*
Given a function g_i from circumstances $\langle w, t\rangle$ to a given agent x_i's goals in $\langle w, t\rangle$:
timely$_g$–FUT$(\langle w, t\rangle) =$
$\{\langle w', t'\rangle \in$ FUT$(\langle w, t\rangle) \mid g(\langle w, t\rangle)$ remain relevant in $\langle w', t'\rangle\}$

The set of *timely* future circumstances for realization, from the point of view of a given circumstance $\langle w, t\rangle$, are those in worlds just like w up to t in which the agent's goals at $\langle w, t\rangle$ are still relevant — still woven into their overall plans and intentions. To reflect this, we define the imperative modal base f with reference to a goal-based ordering source:

(51) A *futurate circumstantial modal base* f is a function from circumstances to sets of propositions where, given a goal-based ordering source g and a circumstance $\langle w, t\rangle$, for all $\langle w', t'\rangle \in \bigcap f(\langle w, t\rangle)$:

a.	$w' = w$	'the circumstance $\langle w', t'\rangle$ obtains in w'
b.	$t \prec t'$, and	't' is future relative to t'

9 Note that this G is not the G$_i$ of the addressee x_i at the time t a directive is issued. The latter only reflects x_i's goals at t, with goals dropped as they are accomplished or abandoned. However, the evolution of G$_i$ over time, like that of the QUD, is tracked in CG.

c. $\exists \langle w', t'' \rangle \in \text{timely}_g\text{-FUT}(\langle w', t' \rangle) : \text{P}(\langle w', t'' \rangle)(a)$
'given the way things are in $\langle w', t' \rangle$, it's possible and still relevant for a to come to realize P'

(51a,b) guarantee that the set of circumstances in which the modal base propositions are true are future circumstances in the world w of f's argument — actual-with-respect-to-w. (51c) restricts $\bigcap f(\langle w, t \rangle)$ to those circumstances in which there is a possible g-timely-future in which P(a) obtains, so that presumably the preconditions for a realizing P in a timely fashion are satisfied. This doesn't guarantee that P will be realized in the future, but that at least — since $\text{FUT}(\langle w', t' \rangle)$ share the same history up to t — the preconditions currently obtain. Hence, if f's argument is the actual present $\langle w^*, t^* \rangle$, (51) yields the set of w^*-actual future circumstances in which the realization of P is possible in a timely fashion.

(52) *Preference order over possible futures*:
Given circumstances c, c' and a hierarchically organized set of goals G, $c >_G c'$ just in case more high-priority goals in G are realized in c than in c'.

The comparison of goal-relative satisfactoriness defined in (52) not only takes into account how many goals are achieved, but gives higher scores for the achievement of higher goals. Adequately working out how to score that is a problem for philosophy of action, not semantics. But as a crude first pass, circumstances might first be ranked with respect to whether they meet the top goal; then ties are broken according to the second-ranked goal, and so forth through the ranked goals.

Now we will use the modal base (51), with the ordering source (49) and the preference order it affords (52) to characterize the *applicable circumstances* — those in which, when an imperative is issued as a directive, the agent is directed to endeavor to realize the imperative's prejacent.

First note that the circumstance of issuance of a directive may not be one of those applicable circumstances — this may be a directive about what to do on some particular future occasion, for example. Moreover, applicability of an action depends on the goals of the targeted agent. If the circumstance of issuance of a directive is $\langle w, t \rangle$, then the ordering source for assessment of the applicability of a given modal base circumstance $\langle w', t' \rangle \in \bigcap f(\langle w, t \rangle)$ is determined not on the basis of the agent's goals in the circumstance of issuance $\langle w, t \rangle$, but by the target agent's goals *at* $\langle w', t' \rangle$, i.e. at the time of the circumstance being rated

for its applicability. I base this assumption on Thomason's (1984) arguments about how obligations change in keeping with changed circumstances: I don't wanna go see old Aunt Agatha, but I oughta. So while I'm waiting at the airport bar for the plane to board, I shouldn't call her and say I can't make it. But if I have one too many martinis and miss the last plane to Nebraska, then I *should* call her to let her know I can't make it. In the case of directives, not only one's circumstances but also one's goals change over time. If at time t one adopts a directive d in the service of a higher goal g, then even if it's possible to realize d at future time t', if g itself has otherwise been realized before t', it may no longer be desirable or necessary to realize d. Mom says *Go visit Aunt Agatha!*, the underlying goal being to offer Agatha the pleasure of your company. Flying to Nebraska is in the service of realizing this directive. But if, while sipping my martini, I have the brilliant idea of bringing Agatha to Chicago for a visit instead, then I can conscientiously call her and say that instead of coming I've bought her a plane ticket and tickets for the Chicago Symphony performing her favorite Bartok concerto for orchestra. Win-win situation. Have another martini and drop the goal of going to Nebraska.

Take $\textbf{!}^{i}_{f,g}[_{\mathrm{S}}\ \mathrm{VP}_i]$ to be the logical form of an English imperative clause without overt subject, the prejacent clause S of type $\langle s, \langle e, t\rangle\rangle$ denoting the property to be realized, and the imperative grammatical mood $\textbf{!}$ indexed to the addressee x_i and relativized to a future-oriented circumstantial modal base f and goal-based ordering source g:

(53) *The applicable circumstances for realization of an imperative*:
For imperative clause $\textbf{!}^{i}_{f,g}\mathrm{S}$, with target agent x_i, circumstance of utterance $\langle w, t\rangle$, context K, futurate circumstantial modal base f and goal$_i$-based ordering source g, where $|\mathrm{S}|^{K,\langle w,t\rangle} = \mathrm{P}_{\langle s,\langle e,t\rangle\rangle}$:

$$\textsc{Applic}_{f,g}(\textbf{!}^{i}_{f,g}\mathrm{S})(\langle w,t\rangle) = \{\langle w',t'\rangle \mid \langle w',t'\rangle \in \textstyle\bigcap f(\langle w,t\rangle)\ \&\ \forall\langle w'',t''\rangle,\langle w''',t'''\rangle \in \text{timely}_g\text{-}\textsc{Fut}(\langle w',t'\rangle):\ [(\mathrm{P})(\langle w'',t''\rangle)(x_i)\ \&\ \neg(\mathrm{P})(\langle w''',t'''\rangle)(x_i)] \rightarrow \langle w',t''\rangle \geq_{g(\langle w',t'\rangle)} \langle w'',t'''\rangle\}$$

'the actual future circumstances $\langle w', t'\rangle$ in which realizing P is feasible and in which x_i coming to have P in a timely fashion would be more in keeping with x_i's goals in $\langle w', t'\rangle$ than x_i not coming to have P'

The order in the last line of (53) is $\geq_{g(\langle w',t'\rangle)}$, so that the ideal is that which reflects x_i's goals and priorities in the realization circumstance $\langle w', t'\rangle$, whatever those may be: Thomason's (1984) observation that what we ought to do at any

given time in a given world is partly a function of what's possible (here: and optimal) *at that world-time*, factors that may change as we go forward. If the goal of realizing the prejacent has already been accomplished or is no longer relevant at some future $\langle w', t' \rangle$, then the realization of P won't make $\langle w', t' \rangle$ g_i-preferred, so $\langle w', t' \rangle$ will not be an applicable circumstance.

Now we can use the notions just defined to characterize the semantic contributions of the imperative grammatical mood:

(54) CHARACTER of English $!^{i}_{f,g}$: [preliminary version, no syntactic subject]
Given context K:
Presupposed content:
x_i = ADDRESSEE(K)
f is a futurate circumstantial modal base
g is an x_i-goal-dependent ordering source
Semantic content: $(\langle\langle s, \langle e, t\rangle\rangle, \langle s, \langle e, t\rangle\rangle\rangle)$
$\lambda P_{\langle s,\langle e,t\rangle\rangle} \lambda\langle w, t\rangle \lambda x \leq_{ind}$ ADDR(K):
APPLIC$_{f,g}(!^{i}_{f,g}\mathrm{S})(\langle w, t\rangle) \subseteq$
$\{\langle w, t\rangle \mid \exists t' : t \prec t' \,\&\, (P)(\langle w, t'\rangle)(x) \,\&\, \langle w, t'\rangle \in \text{timely}_g\text{-FUT}(\langle w, t\rangle)\}$
given a prejacent P: 'being s.t. in any applicable circumstances one comes to realize P in a timely fashion'

$!^{i}_{f,g}$ takes as arguments a property (the type $\langle\langle s, \langle e, t\rangle\rangle$ denotation of its VP complement), the circumstance of evaluation $\langle w, t\rangle$ (in a matrix clause, the circumstance of issuance), and an agent x. $\leq_{ind}$ is the individual-part relation in a plural lattice (Link 1983); so $x \leq_{ind}$ ADDR(K) tells us that the property can only be realized by members of the set of targeted addressees. The i-part relation is reflexive, so if the addressee is singular this guarantees that the target is that single individual; if it is a group, the group is an i-part of itself. The use of the i-part relation to define the target is useful in case the addressee is plural, as we'll see in Section 4 below.

The semantic content, given prejacent P, is the property of being an addressee who in any applicable circumstances — all actual-with-respect-to-circumstance of evaluation $\langle w, t\rangle$ — comes to realize P in a timely fashion. In matrix clauses, the circumstance of evaluation will be the speech world/time, and in embedded clauses, it will be that of the embedding eventuality, as standard in formal semantics. These realization conditions effectively involve a modal: the subset relation between sets of circumstances makes the modal a generalized quantifier over propositions with the force of necessity. Because of the way that the presupposed applicable circumstances are defined, this modal has the flavor of

circumstantial futurity. The circumstances are applicable because they privilege achieving the agent's goals in the applicable circumstances, but the realization conditions don't tell us that those goals include achieving the prejacent itself. That is what *acceptance* of the imperative would ensure. So (54) is not itself deontic.

We can see how this works in the derivation of the simple imperative *Move!*, taking the denotation of *move* to be the property $\textsc{move}_{\langle s\langle s,t\rangle\rangle}$:

(55) $\| \blacktriangledown^{i}_{f,g}\ [_{S}\ \text{Move}] \|^{K} =$
$\lambda P_{\langle s,\langle e,t\rangle\rangle}\lambda\langle w,t\rangle\lambda x \leq_{ind} \textsc{Addr}(K)[\textsc{Applic}^{i}_{f,g}(\blacktriangledown^{i}_{f,g}S)(\langle w,t\rangle) \subseteq$
$\{\langle w,t\rangle \mid \exists t' : t \prec t' \ \&\ P(\langle w,t'\rangle)(x)$
$\&\ \langle w,t'\rangle \in \text{timely}_{g}\text{-}\textsc{Fut}(\langle w,t\rangle)\}](\textsc{move})$
$\equiv_{\lambda\text{ conversion}}$
$\lambda\langle w,t\rangle\lambda x \leq_{ind} \textsc{Addr}(K)[\textsc{Applic}^{i}_{f,g}(\blacktriangledown^{i}_{f,g}S)(\langle w,t\rangle) \subseteq$
$\{\langle w,t\rangle \mid \exists t' : t \prec t' \ \&\ \textsc{move}(\langle w,t'\rangle)(x)$
$\&\ \langle w,t'\rangle \in \text{timely}_{g}\text{-}\textsc{Fut}(\langle w,t\rangle)\}]$
'the property of being an addressee x s.t. x moves in a timely fashion in any of the actual$_{\text{wrt-}w}$ future applicable circumstances'

As in Kratzer, a modifying *if*-clause adds its proposition to the modal base determined by f.[10] This, as in Kaufmann's work, immediately predicts the correct interpretation for examples like (17)–(19):

(17) *If you're hungry*, have some cheese and crackers.

(18) [Army combat instructor to students:]
Before you walk into an area where there are lots of high trees, *if there might be snipers hiding in the branches*, use your flamethrowers to clear away the foliage. [after Egan, Hawthorne & Weatherson 2005]

(19) [two crooks planning a robbery:]
A: What should I do *if the cops arrive*?
B: Start shooting.

These utterances are not conditional speech acts. In each, the speaker issues a practical direction. But, just as goals are generally conditional, these imperatives typically yield directions (or suggestions, etc.) to be realized contingent on certain conditions obtaining. An *if*-clause just makes explicit some of the conditions on applicability. If the addressee accepts one of these directives, they adopt the

10 One might follow Cariani & Santorio 2018 in taking the *if*-clause to be anaphorically linked to the tacit modal base argument.

relevant conditional goal and hence have conditional commitments: intentions to realize the prejacent property *should the relevant conditions obtain.*[11]

In some contexts of utterance, there may be but one applicable circumstance; e.g., if someone whose plane has been cancelled asks 'what do I do now?', one might answer 'rent a car', and in that case the current situation (*now*) is the single applicable circumstance. This is the case in (17), where the 'now' in the antecedent of the conditional is tacit; this is not understood as directions for taking care of hunger at any time. In others, as in a recipe or driving directions, the direction may constitute general instructions, to be realized whenever circumstances conform to the described scenario.[12] This is the case in (18). (19) is neither specific to a particular moment nor completely general, but pertains to what A should do at any point during the robbery should the cops arrive. In (19), RELEVANCE to the QUD facilitates modal subordination (Roberts 1989) — the usual context-sensitive domain restriction of a modal, here guided by the assumption that the result should make the interpretation of B's reply relevant to A's question.

2.2 The pragmatics of imperatives used as directions

The default use of a root imperative clause, the natural use in view of its semantics, is to issue a direction to the target agent — a suggestion to adopt the goal

11 Thony Gillies (p.c.) asks how the tense in the antecedent of a conditional imperative bears on its interpretation, given (54). Consider:

(i) If you find a good deal on a used car, buy it!

(ii) If you found a good deal on a used car, buy it!

(iii) #If you were given the candy before John ate it, eat it!

(iv) If you will be leaving from LaGuardia tomorrow, visit the new sculpture in Terminal B.

In each, the *if* clause constrains the applicable circumstances. In (i) and (ii), that would mean that they are those in which the addressee finds (at some future time) or has found (at some relevant past time) a good deal, and (modulo any other tacit constraints) the addressee is enjoined to buy said car when these circumstances obtain: immediately if the deal has already been found, or at the relevant future time. (iii) is infelicitous because the past tense in the subordinate *John ate it* in the *if*-clause entails that the candy has been eaten, so that it's impractical for the addressee to adopt the goal enjoined in the main clause. And in (iv), the visit cannot obtain before such time as the addressee is leaving from LaGuardia, if ever; so the tense in the prejacent pragmatically constrains interpretation of the main clause. But this is all standard temporal interpretation, nothing special about conditional imperatives.

12 As Rich Thomason (p.c.) points out, in such cases there is also an element of genericity involved in the interpretation. Space precludes addressing that here.

of realizing the imperative. Here is a general statement about the relationship between grammatical mood and illocutionary force:[13]

(56) *Illocutionary Force Linking Principle*

a. The default illocutionary force of a root sentence S whose denotation ||S|| is a proposition is that of an assertion.
b. The default force of a root sentence S whose denotation ||S|| is a set of propositions is that of interrogation.
c. The default force of a root sentence S whose denotation ||S|| is an indexed property is that of direction.

Parallel to Stalnaker's (1978) pragmatics for assertion (57), Roberts' (1996) pragmatics for interrogation (58), (59) is the default pragmatics for a direction issued by uttering an imperative in context K:

(57) *Assertion*: (following Stalnaker 1978)
If a proffered proposition is asserted by the speaker and accepted by the interlocutors as true in a discourse K, the proposition is added to CG_K.

(58) *Interrogation*: (Roberts 1996)
If a question, a set of propositions, is posed by the speaker and accepted by the interlocutors in a discourse K, then the question is added to QUD_K.

A question is removed from QUD_K once its answer is entailed by QUD_K, or it is determined to be practically unanswerable, or it is no longer relevant to some question or goal it subserves in the strategy of inquiry reflected in QUD_K (so the super-question or goal has been answered or abandoned).

(59) *Direction*:
If a targeted property is issued to the addressee i in a discourse context K and is accepted by i, then G_i in K — the set of i's evident goals and plans — is revised to include the realization of the property by i in any applicable circumstances.

G_i is revised to remove the goal of realizing the targeted property once it is no longer potentially applicable (it has been realized, or it is determined that it cannot be practically realized) or in case the overarching goals and plans it subserves have been otherwise realized or abandoned.

13 (56) is Roberts' (2018) modification and extension of the IFLP in Portner 2004, Zanuttini, Pak & Portner 2012.

Recall that the goals in G on the scoreboard are themselves all conditional: We generally commit to achieving something conditional on certain assumptions and preconditions. So the conditional character of the semantic content of imperatives is not coincidental. The fact that the plans in G_i are *evident* to the interlocutors implies that i is publicly committed to their realization under the applicable circumstances, i.e. that *i intends to realize them*. As I argued at the outset, the right sort of object for such an intention is given by the realization conditions denoted by an imperative (54), not the propositional content of an indicative.

3 Satisfying the Desiderata from Section 1

We generally expect that clauses of all types can be embedded; other accounts of embedded imperatives (e.g. Pak, Portner & Zanuttini 2004, Crnič & Trinh 2009, Charlow 2010, Zanuttini, Pak & Portner 2012, Kaufmann 2012, Kaufmann & Poschmann 2013, Portner 2011) can readily be modified to work with the theory in Section 2. Crucially, since the imperative semantics given here includes no illocutionary force, this correctly predicts that such embedded uses, including those as sentential complements, will not be understood to issue directions.

Other desiderata from Section 1 are satisfied very straightforwardly by the account in Section 2:

- Desiderata (a) (not felicitously subject to judgements of truth or falsity) and (b) (cannot occur with evaluative sentential adverbials) follow from the semantic type of an imperative clause: Imperatives do not denote propositions, hence cannot be evaluated for truth or falsity.
- This also explains desideratum (c) (do not occur in the antecedent of a conditional). Conditional antecedents denote propositions, and imperatives are not propositional in semantic type, explaining their semantic anomaly in that position.
- Differences in felicity between uses of imperatives and deontic declaratives (d) follow from their distinct pragmatic functions, captured by the Illocutionary Force Linking Principle. The explanation for the contrast noted by Portner between (15a) and (15b) follows from the present account just as it does in Portner's: One can reasonably issue a direction following on the asserted truth of the corresponding deontic (since people often don't do what they should do). But re-asserting the same declarative would

be redundant, explaining the infelicity of (15b). In (16a) the speaker has just given an excuse for the addressee to ignore what she should do (after all, the consequences aren't that bad), so the imperative is acceptable; but this doesn't change the truth of the original negative deontic, explaining the sense of contradiction in (16b).

- The satisfaction of desiderata (e) (the conditional character of imperatives) and (h) (evidence of present/future time) is obvious in (54), since the imperative's semantic content is explicitly conditional and (via the definition of applicable circumstances) futurate. The use of *will* in English for imperative tags like those in (36) is even more natural if we take futurate *will* to be a modal,[14] in such examples undergoing modal subordination via a modal base implied by the initial imperative.
- The satisfaction of desideratum (f), explaining the variable flavor of modals, is illustrated via informal application to a few examples from above, where $\langle w^*, t^* \rangle$ is the circumstance of utterance, and for simplicity we only consider the relevant priorities at utterance time, $g(\langle w^*, t^* \rangle)$, rather than at the realization time:

a command:

(20) [Boss$_7$ to tardy employee$_{11}$:] Tomorrow get to work on time!

$f_{13}(\langle w^*, t^* \rangle) \subseteq$ CG: {..., that x_7 has power over employees, that employees serve at the pleasure of x_7, that x_7 is x_{11}'s boss, that x_{11} has been late several times, that being late is unacceptable and displeases x_{11}, that it is in principle possible for x_{11} to be on time tomorrow, that x_{11} will come to work the day after the utterance time,...}

$g_{13}(\langle w^*, t^* \rangle)$: {..., p = that x_{11} continues to be employed, q = that x_{11} pleases x_7, ...}

- p, q correspond to goals in the employee x_{11}'s G_{11}, where q subserves p
- q corresponds to a goal in the boss x_7's G_7, though x_7 may be indifferent to p

14 See the extensive literature treating the future as modal cited in Giannakidou & Mari 2018, Cariani 2021.

Given these values for f and g, the applicable circumstances are those in $\bigcap f_{13}(\langle w^*, t^*\rangle)$ which come closest to the ideal in which x_7 pleases x_{11} and thereby retains her position. Then the realization conditions, what the world would have to come to be like in order for this command to be realized by the target employee, are that in all the applicable circumstances (where x_{11} is on the way to work the next day), x_{11} gets to work on time.

a conditional instruction:

(18) [Army combat instructor to students:] Before you$_6$ walk into an area where there are lots of high trees, if there might be snipers hiding in the branches, use your$_6$ flamethrowers to clear away the foliage.

$f_{11}(\langle w^*, t^*\rangle) \subseteq$ CG: {..., that you are in a combat situation with a high likelihood of enemy in the vicinity, that if your enemy sees you before you see them, there is a greater chance that they'll kill you than that you'll kill them, that hiding in high trees gives snipers an excellent vantage point over the entire area—better than that of someone entering on the ground level, that flamethrowers can destroy foliage at a distance from a sheltered position, that it is possible for you to use the flamethrower,...} ∪ {that there are snipers hiding in the branches}

$g_{11}(\langle w^*, t^*\rangle)$: {..., p = that you survive, q = that you kill as many enemy as possible, r = that you refrain from killing innocent non-combatants,...}

- for addressees $x_{60} \in x_6$, p, q, r correspond to goals in G_{60}, where presumably $p >_{G_{60}} r >_{G_{60}} q$, and q subserves p.

The underlined propositions in $f_{11}(\langle w^*, t^*\rangle)$ are about a hypothetical type of situation, hence do not obtain at the issuance time; (18) might be uttered in a classroom, describing how to behave in a combat situation. The remaining propositions are general knowledge in the CG. The union with *that there are snipers*...reflects the *if*-clause. The applicable circumstances are those in $\bigcap f_{11}(\langle w^*, t^*\rangle)$ which come closest to the ideal in

which x_{60} both survives and kills as many enemy as possible, preferably while not killing non-combatants. In order to realize these instructions in such a circumstance, x_{60} would use the flamethrower to exfoliate the trees.

an invitation (a type of permission):

(60) [The hostess$_7$ has just baked a batch of cookies. Speaking to her guest$_3$:] Have a cookie.

$f_{16}(\langle w^*, t^*\rangle) \subseteq$ CG: {..., that x_7 is hostess; that x_3 is a guest; that a guest in someone's home has only those rights there that are granted by the host(ess), and, in particular, may only eat what is offered by the hostess; that the smell of fresh-baked goods tends to make one hungry; that most people like cookies; that bakers tend to be proud of their baking and enjoy praise of its virtues; that both x_7 and x_3 seem to be well-intentioned and want to meet their obligations as hostess and guest,...}

$g_{16}(\langle w^*, t^*\rangle)$: {..., p = that x_7 strive to satisfy x_3's reasonable desires during the visit to her$_7$ home (especially by offering food); q = that x_3 attempt to please x_7, r = neither hostess nor guest impose their will on the other unnecessarily,...}

The applicable circumstances are those during the visit: the time of issuance $\langle w^*, t^*\rangle$ and immediately thereafter. $\bigcap f_{16}(\langle w^*, t^*\rangle)$ reflects the assumption that the guest is likely to want to eat a cookie, but that, since he would only be within his rights to do so if he were given permission by the hostess and he is well-intentioned, he (a) will not eat a cookie without permission but (b) would like to be given permission to do so. Then given the hostess's obligations, as partly given by p, and the observation that she seems to be positively inclined toward her guest, it can be inferred that offering the guest a cookie is intended by the gracious hostess to invite him to do something pleasing. So we understand the utterance to amount to a proposal that the guest adopt the goal of eating a cookie, *should he wish to do so*. Though this is merely an invitation, and a hostess is not supposed to impose her will on a guest, note that the ideal guest who wants to satisfy the goal in q of pleasing a hostess who is proud of

her cookies, having been given permission will, in fact, eat a cookie and praise it. So even though, by r, the hostess's offer is not an obligation come-what-may, the guest's own desire to be a good guest may tend to impose on him an obligation to be polite in response. Due to the social roles that underlie them, invitations can be complicated. But in any case, they aren't orders.

Desideratum (g) (the imperative modal does not occur under the scope of negation) is satisfied for two reasons. First, the imperative clause denotes not a proposition but a property. Hence, it is the wrong semantic type to serve as argument of standard propositional negation. As we will see in Section 4, negation can be introduced by one of the arguments of the imperative — so-called "internal negation", but this yields only narrow scope relative to the imperative. We conclude that the negation in examples like (32a) cannot take wide scope over the futurate modal contributed by imperative mood, only yielding a NEG-V interpretation:

(32) a. Don't go out!
can't mean: 'there's no obligation to go out'
Instead, constitutes a direction to not go out.

Second, actionable (32a) is understood as a practical direction, and hence it has a deontic flavor contributed by its pragmatic function: proposing a goal which the addressee is committed to achieving. This pragmatic deontic flavor is not part of the semantic content of the utterance. But logical operators like negation only take as their scope semantic content in the utterance in which they occur, as attested by the failure of presupposed and conventionally implicated content to interact with operators in semantic content (Karttunen & Peters 1979, Heim 1983, Potts 2005, etc.). Thus, pragmatic contributions like the deontic flavor of a practical direction do not interact logically with semantic negation.

With respect to the desiderata in (i), reflecting parallels between imperatives and deontic declaratives, Portner (2004, 2007, 2018a) offers an account of these examples that can be readily realized in the present account of practical directions. Recall that for Portner:

- Directions are intended to update the ToDo lists of the addressee.
- A ToDo list in a dynamic pragmatic context is a reflection of the target's public commitments. Accordingly, these commitments are also reflected in the CG as deontic propositions: If I'm committed to realizing δ, then it's true that I should do δ.

In the definition of the Scoreboard in Section 2.1, it is specified that all content in QUD and G are reflected in CG, guaranteeing the public character of these elements of the conversational context. Substituting G for ToDo, this accounts for the deontic-like behavior of the imperatives in (37)–(39), in a way parallel to Portner's account. For example, in (37), it is not that the semantic content of the imperative clause by itself entails the corresponding deontic, for the former is not itself a proposition:

(37) [father to son:]

a. Finish your homework before you surf the web.

b. You must finish your homework before you surf the web.

Rather, it is the pragmatics of an imperative, how its acceptance as a directive *contributes to G* that is deontic. Adding the directive (37a) to the son's set of goals and plans G_{son} will automatically be reflected in the CG as the truth of (37b). Thus, the deontic effect will only be reflected in the CG, not in the LF of (37a) itself.

This bears generally on the question of the logic of imperatives. Geach (1958) argues that it is quite distinct from that of deontics, and I concur.[15] And the explanation Portner proposes is consistent with the underlying insights of Mastop (2011), who offers a sophisticated logic of imperatives in Update Semantics. For φ, 'the message conveyed by some expression', Mastop offers a mood-neutral logical relation of SUPPORT for φ by an interlocutor's "commitment slate", which is effectively another form of scoreboard not unlike that in Section 2.1 above:

S supports φ: $S \models \varphi$ iff $S[\varphi] = S$

> 'a commitment slate supports some expression if accepting the message it conveys does not have any effect.'

The scoreboard that results from adding (37a) to the son's "commitment slate" G_{son} and automatically updating CG will support the truth of (37b) in Mastop's terms. So acceptance of (37a) supports the truth of (37b).

Similarly, two directives are consistent at a given time if both can be practically realized by the targeted addressee at some future time; that is, the realization of each is consistent with the realization of the other — which might be tested by seeing whether the CG can be updated with the two propositions

15 I was made aware of Geach 1958 late in the development of this account by an anonymous reviewer, to whom I am grateful.

reflecting those realizations. Mastop (2011) takes consistency of directives to require that a commitment slate updated with both directives must not be absurd, which I think amounts to much the same thing.[16] Similarly, a directive d issued at a given time is consistent with proposition p just in case the realization of d at some future time is consistent with the truth of p.

All this, and the treatment of the deontic flavor of imperatives as solely pragmatic, is broadly consistent with Geach's view of the logic of imperatives, which he takes to be "fairly trivial" (1958: 51):

> …For every proper imperative, there is a future-tense statement whose 'coming true' is identical with the fulfillment of the imperative. This is the source of everything that can be said about the inferability, incompatibility, etc. of imperatives; their being imperatives does not affect these logical interrelations…

There is, of course, much more to be said about the logic of imperatives, especially about disjunctive imperatives. But I hope this brief discussion will suffice to suggest that the proposal here is compatible with sophisticated views currently on offer.

In this connection, note that embedding our account in a dynamic pragmatics of the sort sketched in Section 2 affords considerable explanatory potential. For example, consider the role of RELEVANCE to the QUD in determining both realization conditions and intended illocutionary force: Recall examples (7), (8) above, where a declarative is not asserted, an imperative is not directive, as evident from the QUD. And in (19), the QUD affects our understanding of the realization conditions:

(19) [two crooks planning a robbery:]
A: What should I do if the cops arrive?
B: Start shooting.

B replies to A's question using an imperative clause, thereby issuing a direction. But we don't understand B to direct A to start shooting in the present circumstance. Rather, in order to take B's utterance to be RELEVANT to A's question, we understand it to mean 'if the cops arrive, start shooting', accommodating the content of the *if*-clause from the question to add it to the modal base for the futurate modal.

16 This discussion is highly simplified: See also Charlow's (2011) discussion of logical and practical constraints on plans and how these bear on the felicity of directives.

In addition, I have argued in Roberts 2018 that all of Kaufmann's pragmatic constraints on felicitous utterance of imperative clauses, including her Epistemic Certainty Condition, follow from RELEVANCE and other features of the pragmatic framework in Section 2. Space precludes repeating those arguments here; please see that discussion.

4 Imperative subjects

In English, as in many other languages (see the overviews and literature cited in Mauck et al. 2005, Zanuttini 2008, Zanuttini, Pak & Portner 2012, and especially Kaufmann 2012), we find a variety of overt imperative subjects, like those in (61)–(63) and (42):

(61) a. You get moving!
b. You boys get moving!

(62) Boys be the cops and girls be the robbers! [Schmerling 1982]

(63) Somebody help me! [Portner 2017]

(42) Nobody move! [Veltman 2018]

While there is still some controversy about the data to be accounted for, the most empirically promising view to date is of the sort proposed by Zanuttini (2008), Zanuttini, Pak & Portner (2012), and Kaufmann (2012), and endorsed by Portner (2017), all of whom use an agreement feature to restrain acceptable imperative subjects. This section will briefly sketch how the agreement approach to imperative subjects might be integrated with the semantics in Section 2, and then address Charlow's (2018) critique of the agreement approach.

Portner (2017: 597) describes the approach as follows:

> [T]he key idea is that there is a person feature [person: 2] on the imperative verb or a functional projection which enters an agreement relation with the subject, thereby making sure that the subject has this feature. In simple cases [like (61a) and (61b)], the second person feature ensures that the subject refers to the addressee. More complex are cases with non-pronominal subjects like [(62)] and quantified subjects like [(63) and (42)]… [Kaufmann] (2012)…shows how it is possible to integrate a semantics of person agreement with generalized quantifier theory [to yield a] meaning for the person feature on which it makes sense to say that the subject of [(62), (63) or (42)] is second person.

Kaufmann takes imperative subjects to be generalized quantifiers; as usual, pronouns and other non-quantificational NPs can be type-raised to this type. Her central insight is that imperative mood selects for a subject which *lives on* the addressee, a notion from generalized quantifier theory. The set of quantifiers that live on some set (Barwise & Cooper 1981) is the set of conservative quantifiers (van Benthem 1983, 1984). In extensional terms:

> *lives-on*: for all sets of individuals A, generalized quantifiers NP of type $\langle\langle e,t\rangle,t\rangle$, we say that ||NP|| *lives on* A just in case for all sets of individuals X: X ∈ ||NP|| iff (X ∩ A) ⊆ ||NP|| [Barwise & Cooper 1981]

We intensionalize this notion and take into account the context of interpretation K, since we will be considering indexical subjects like *you*. Then we have the following, where for any set of individuals A in the domain of the model, ^A $= \lambda w$.A:

> *lives-on*: In context K, $||\text{NP}_{\langle\langle s,\langle e,t\rangle\rangle,\langle s,t\rangle\rangle}||^K$ *lives on* set A just in case $\forall \text{P}_{\langle s,\langle e,t\rangle\rangle}\, \forall w.\, ||\text{NP}||^K(\text{P})(\text{w}) = 1$ iff $||\text{NP}||^K(\text{P} \,\&\, {}^\wedge\text{A})(\text{w}) = 1$.

Kaufmann notes that since the set of sets that a conservative generalized quantifier Q lives on is a filter (Johnsen 1987), we can assume that these subjects all have a smallest element, the intersection of the sets that live on Q. Then:

(64) For any given conservative quantifier Q, *SL(Q)* is the smallest set Q lives on. [Kaufmann 2012]

(65) *Conservativity constraint on imperative subjects:* [after Kaufmann 2012] An imperative subject NP denotes a conservative generalized quantifier Q that lives on the set of addressees:[17] SL(Q) is the set of addressees.

(65) guarantees that these NPs either denote the addressee, as in (61a), (61b), (62), or take the addressee as their quantificational domain, as in (63) or (42).[18]

17 I use the category NP to refer to the full range of nominal arguments, including pronouns, indexicals, proper names, and those typically termed DPs by many syntacticians since Abney 1987, e.g. those with overt articles or quantificational determiners. Nothing in this analysis clearly argues for or against Abney's DP hypothesis, and I would argue that most of the types of English NPs considered here do not have tacit determiners or functional projections. For useful recent overviews of the NP vs. DP debate, see Salzmann 2020 and Köylü 2021.

18 I focus here on the conservativity constraint. Kaufmann also requires that imperative subjects be automorphism invariant (van Benthem 1983, 1984; Peters & Westerståhl 2006), which ensures that quantificational subjects of imperatives are logical, properly precluding imperative subjects like *Mary's four friends*, *more male than female students* or *no student but Mary*. And she requires that an imperative subject not be degenerate, which means that its domain is not null and for

Zanuttini, Pak & Portner (2012) consider cases like (62) with bare noun subjects. They suggest (quoting here from an earlier draft) that "The subjects in [(62)] can…be treated like overt modified pronouns (e.g. *you boys*, cf. Lyons 1999)", and hence of the same sort as (61b). I'll assume this is the correct analysis.[19]

Mauck et al. (2005), Zanuttini (2008), and Kaufmann (2012) adopt agreement features on the functional projection associated with imperative mood in LF. Kaufmann's feature requires that the subject satisfy the conservativity constraint. I will capture (65) via a presupposition on the imperative mood, facilitated by the agreement between imperative operator and subject.

Syntactically, an imperative clause takes a full sentential prejacent, type $\langle s, t\rangle$. As in the Kaufmann/Portner approach, there is an agreement feature on the imperative verb projection, yielding an LF with the subject indexed to the imperative operator. The subject is presupposed to live-on the contextually given addressee, constraining the range of possible subject denotata.

We can assume a uniform semantic type for imperative subjects if we take pronominal *you* to have the higher, Montagovian generalized quantifier type $\langle\langle s, \langle e, t\rangle\rangle, \langle s, t\rangle\rangle$, with the interpretation $\lambda P.P(x^2)$, where x^2 is indexically anchored to the (set of) addressee(s). We can also posit a null imperative subject with the semantics of overt *you*, either licensed by the indexical presupposition of ❗ or represented as a null indexical pronoun at LF:

(66) $\mathbf{pro}^2_i$ type $\langle\langle s, \langle e, t\rangle\rangle, \langle s, t\rangle\rangle$

Presupposed content, given context K:

$\exists \delta_i \in \mathrm{DR}_K$ s.t. $\forall \langle g, w\rangle \in \mathrm{FILE}_K : g(\delta_i)(w) = \mathrm{ADDR}(K)$

Semantic content: $\lambda Q_{\langle s,\langle e,t\rangle\rangle}(x_i)(w)$

This pro^2_i is a 2nd person indexical generalized quantifier, whose value across all worlds in the CS in any context where it is felicitously used (one in which the familiarity presupposition is satisfied) is the addressee. Of course, this pronoun lives on the addressee, so satisfies (65).

Given that imperative clauses bear subjects, what does this tell us about their semantic type? As noted above, clausal argument structure does not determine

some X the domain is not the entire domain of the model. Non-degeneracy will be captured in our characterization (67) below by the presupposition that there is an addressee. It seems to me that we might also want to preclude proportional quantifiers like those in (i), but I won't pursue that intuition here:

(i) #/* A few/few/many (of you) move!

19 In fact, I think it can be argued that it follows from these NPs' felicitous use as subjects of an imperative, given the presupposition (67a) below.

semantic type; e.g., the interrogative mood in a polar question takes a type $\langle s,t\rangle$ prejacent to yield a question, type $\langle\langle s,t\rangle,t\rangle$. As in Section 2, the type of an imperative clause — whether or not it has an overt subject — is that of a property: $\langle s,\langle e,t\rangle\rangle$. But here the imperative prejacent includes an NP subject and VP predicate of the usual types ($\langle\langle s,\langle e,t\rangle\rangle,\langle s,t\rangle\rangle$ and $\langle s,\langle e,t\rangle\rangle$, respectively), compositionally combined; the intension of the result (type $\langle s,t\rangle$) serves as the propositional argument of imperative mood $\textbf{!}$, which then abstracts over the indexically presupposed subject of the prejacent proposition to yield a property.

Here is the revised semantics for English imperative mood, assuming the definition of $\textsc{Applic}_{f,g}$ in (53) from Section 2:

(67) **Character of English $\textbf{!}^i_{f,g}$:** [final version, with subject]
Given context K, modal base f, ordering source g, then $\textbf{!}^i_{f,g}$ has:

Presupposed content:

a. subject $\text{NP}_{i\ \langle\langle s,\langle e,t\rangle\rangle,\langle s,t\rangle\rangle}$ is s.t. $\text{SL}(\|\text{NP}_i\|^K) = \textsc{Addr}(K)$
'the subject NP lives-on the addressee'

b. f is a futurate circumstantial modal base

c. g is an x_i-goal-dependent ordering source

Semantic content: type $\langle\langle s,t\rangle,\langle s,\langle e,t\rangle\rangle\rangle$

$\lambda p_{\langle s,t\rangle}\lambda\langle w,t\rangle\lambda x_i \leq_{ind} \textsc{Addr}(K)[\textsc{Applic}_{f,g}(\textbf{!}^i_{f,g}S)(\langle w,t\rangle) \subseteq$
$\{\langle w,t\rangle \mid \exists t' : t \prec t' \ \&\ p(\langle w,t'\rangle) \ \&\ \langle w,t'\rangle \in \text{timely}_g\text{-}\textsc{Fut}(\langle w,t\rangle)\}]$

Given prejacent p: 'the property of being s.t. in the applicable circumstances the prejacent p is realized in a timely fashion'

The indexed Conservativity presupposition (67a), guaranteeing that the subject lives on the targeted addressee, is effectively a selectional restriction of imperative mood. In the semantic content, although x_i does not occur bound in the scope of λx_i, its denotation is presuppositionally guaranteed to be a member of the indexically-targeted addressee; so we can be assured that λx_i does, pragmatically, reflect realization conditions for x_i. Any addressee who sincerely accepts a directive made with the imperative thereby undertakes to endeavor to ensure that the predicate is realized by the addressee(s) in the applicable circumstances. To see how this works, let's work through an example. Consider again (42) *nobody move!*. For it to be felicitous, in view of the conservativity presupposition in (67), the subject *nobody* in (68a) must live on the addressee, its domain thereby presuppositionally restricted with the bold-face content in (68b):

(68) a. $nobody_i$ $\lambda Q_{\langle s,\langle e,t\rangle\rangle}\lambda\langle w,t\rangle\forall x_i[\neg Q(x_i)(w)]$

b. $nobody_i$ with its domain restricted by satisfaction of the presupposition (67a):
$nobody^2_i$ $\lambda Q_{\langle s,\langle e,t\rangle\rangle}\lambda\langle w,t\rangle\forall x_i : \boldsymbol{x_i} \leq_{\boldsymbol{ind}} \textbf{ADDR}^K[\neg Q\{x_i\}]$.

This takes a property Q to yield quantification over the set of addressees, saying of the individual parts (members or subsets) of the addressee(s) that in the relevant circumstance $\langle w,t\rangle$, they fail to have Q.

With the subject so restricted, we derive the semantic content for (42) as follows (which should be compared to subjectless (55) above):

(42′) Given context K, and with $\|\text{move}_{\langle s,\langle e,t\rangle\rangle}\|^K = \text{MOVE}$ and with the Conservativity presupposition (67a) satisfied by *nobody*:

a. $\|[_S \text{Nobody}_i \text{ move}]\|^K$

$\equiv_{(68)}$

$\lambda Q_{\langle s\langle e,t\rangle\rangle}\lambda\langle w,t\rangle.\forall x_i : x_i \leq_{ind} \text{ADDR}^K[\neg Q(\langle w,t\rangle)(x_i)](\text{MOVE})$

$\equiv_{(\lambda\text{ conversion})}$

$\lambda\langle w,t\rangle.\forall x_i : x_i \leq_{ind} \text{ADDR}^K[\neg\text{MOVE}(\langle w,t\rangle)(x_i)]$

b. $\| \blacktriangledown^i_{f,g}\ [_S \text{Nobody}_i \text{ move}] \|^K$

$\equiv_{((67),(42'\text{a}),\text{substitution, alphabetic variance})}$

$\lambda p_{\langle s,t\rangle}\lambda\langle w,t\rangle\lambda x \leq_{ind} \text{ADDR}(K)[\text{APPLIC}_{f,g}(\blacktriangledown^i_{f,g}\text{S})(\langle w,t\rangle) \subseteq$
$\{\langle w,t\rangle \mid \exists t' : t \prec t' \ \&\ p(\langle w,t'\rangle) \ \&\ \langle w,t'\rangle \in \text{timely}_g\text{-FUT}(\langle w,t\rangle)\}]$
$(\lambda\langle w'',t''\rangle.\forall x_i : x_i \leq_{ind} \text{ADDR}^K[\neg\text{MOVE}(\langle w'',t''\rangle)(x_i)])$

$\equiv_{(\lambda\text{ conversion})}$

$\lambda\langle w,t\rangle\lambda x \leq_{ind} \text{ADDR}(K)[\text{APPLIC}_{f,g}(\blacktriangledown^i_{f,g}\text{S})(\langle w,t\rangle) \subseteq$
$\{\langle w,t\rangle \mid \exists t' : t \prec t' \ \&$
$\lambda\langle w'',t''\rangle[\forall x_i : x_i \leq_{ind} \text{ADDR}^K[\neg\text{MOVE}(\langle w'',t''\rangle)(x_i)](\langle w,t'\rangle)$
$\&\ \langle w,t'\rangle \in \text{timely}_g\text{-FUT}(\langle w,t\rangle)\}]$

$\equiv_{(\lambda\text{ conversion})}$

$\lambda\langle w,t\rangle\lambda x \leq_{ind} \text{ADDR}(K)[\text{APPLIC}_{f,g}(\blacktriangledown^i_{f,g}\text{S})(\langle w,t\rangle) \subseteq$
$\{\langle w,t\rangle \mid \exists t' : t \prec t' \ \&\ \forall x_i : x_i \leq_{ind} \text{ADDR}^K[\neg\text{MOVE}(\langle w,t'\rangle)(x_i)]$
$\&\ \langle w,t'\rangle \in \text{timely}_g\text{-FUT}(\langle w,t\rangle)\}]$

'the property of being an i-part of the addressee(s) in K s.t. in all the applicable circumstances there is a timely future circumstance in which every addressee refrains from moving'

This property targets the addressee(s) in K (the $x \leq_{ind} \text{SL}(nobody_j)$), and is the property that they each have if in the applicable future conditions none of them moves. The presupposed restriction of the domain of $\forall$ to individual

parts of the addressee(s) is what guarantees that when this targeted property is issued as a direction the addressees are thereby enjoined to adopt an intention to so refrain: In a felicitous context the addressees recognize themselves *qua* addressees, and hence as those who are directed to contribute toward the realization of these conditions by not moving in the applicable circumstances. Thus, the relation between x and the domain of the quantifier in the realization conditions is *de se*, epistemically binding the non-movers to the targeted addressees.

Charlow's problem:

Charlow (2018) criticizes Kaufmann's (2012) and Portner's (2017) agreement-based proposals for the semantics of imperatives with QP subjects like *nobody* or *everybody*, arguing that their semantic contents would impose the deontic onus on the entire group when it should only be imposed on its individual members. Mastop (2011) offers a similar critique in a more general form. But I think that matters are rather more complicated.

Consider (69):

(69) Everyone$_j$ gather in the center of the room!

(69′) $\lambda\langle w,t\rangle\,\lambda x \leq_{ind} \textsc{Addr}(K)[\textsc{Applic}_{f,g}(\mathbin{!}^{i}_{f,g}\mathrm{S})(\langle w,t\rangle) \subseteq \{\langle w,t\rangle \mid \exists t' : t \prec t' \;\&\; \forall x_i \leq_{ind} \textsc{Addr}^{K}[\textsc{gather}(\langle w,t'\rangle)(x_i)] \;\&\; \langle w,t'\rangle \in \text{timely}_g\text{-}\textsc{Fut}(\langle w,t\rangle)\}]$

'the property of being an individual-part of the addressee(s) in K s.t. in all the applicable circumstances there is a timely future circumstance in which all the addressees gather in the center of the room'

The predicate *gather* can only be true of a group consisting of at least (say) three or more individuals. This selectional restriction pragmatically limits the i-parts of $\textsc{Addr}(K)$ over which the universal ranges ($x_j \leq_{ind} \textsc{Addr}(K)$) to subgroups of cardinality three or more. Then the realization conditions require that all such subgroups of the addressees gather in the center of the room.

Assuming that the set of addressees for such an utterance is a plural group, what is it for a group to accept such a direction? It seems that an intention is something that only a singular sentient being can adopt: We can jointly commit to coming to the party only if we each singly so-intend. So the addressees accept the direction as a group, but if sincere must adopt related intentions as individuals. Jointly committing to do something puts some onus on each member of the relevant group to ensure that the group all follow through. An

individual who accepts the directive must adopt the intention to behave in such a way as to promote its realization however they can, in this case at least by moving themself to the middle of the room — just as to realize (42) one must refrain from movement.

Similarly with *Four of you lift this piano!*: If a group of twenty addressees accepts this direction, each is committed to cooperate as needed to see that it is realized. If some member of an original sub-group of four lifters drops out, others would need to step up. That is, the intentions adopted are *to promote realization*, one's particular role in doing so pragmatically determined. If I spill my soup in a restaurant and call out *Somebody clean up this mess!*, the job of the maître d' among the addressees is not so much to do the cleaning, but to see that it is done. Etc.

I think examples like (69), and the question of individual obligations for others' behavior in a group, argue that Charlow's (2018) criticism is misguided. As an addressee who accepts a direction, one is to add the intention to see that the proffered realization conditions are realized, and one must develop a practical plan for how one would contribute to that realization.

In fact, Charlow's proposed solution to this problem runs into its own difficulties. On his account, imperatives display illocutionary force in their logical forms, and hence at LF a quantificational subject can take wider scope than the illocutionary force operator. In this way, (42) could have an LF with the semantic content 'for all addressees, adopt the intention not to move', and *Somebody help me* could mean 'for some addressee, adopt the intention to help me'. That is appealing for those matrix imperatives, but it fails to deliver an acceptable analysis of embedded examples like (70), reporting on Steve's direction:

(70) Steve$_i$ demands no-one move your baggage or touch his$_i$ until it's all been inspected!

The lack of declarative verb agreement on *move* and the 3rd person *his* bound by *Steve* argue that the complement sentence is imperative but not a direct quotation. However, embedded imperatives have no illocutionary force, so taking force to have narrow scope relative to the tacit subject cannot provide a solution for how to distribute the direction over multiple addressees in the embedded clause in (70) while leaving the negation associated with *no-one* to act as predicate term negation of the embedded predicate. The present proposal doesn't encounter this problem.

5 Comparison with other accounts

The present account adopts important features of the most linguistically sophisticated, complete accounts on offer, especially those of Portner (2004, 2007, 2011); Schwager (2006) and Kaufmann (2012); and Charlow (2011, 2014). Here I will focus on a few ways in which this account improves on others, resulting in empirical superiority.

The proposal developed in Sections 2 and 4 differs from earlier accounts in several important ways.

- Though there is a modal in the semantic content of an imperative, it is circumstantial and futurate, not deontic. Pragmatically, the proffered content of an imperative, with its realization conditions, is to be added to the addressee's goals; since rational intentions are always practical and oriented toward future realization, this is a natural character for the imperative's modal force. The frequently attested deontic flavor of imperatives is introduced only pragmatically: Just as in Portner's (2007) account, given the commitment associated with intending to realize a goal (Bratman 1987), it is natural that deontic onus should attach to adopting a new intention for addition to G.

- Central to the pragmatics is the role of G, an organized body of the interlocutors' goals, plans, and priorities on the conversational scoreboard. G is independently motivated in the general pragmatic framework I assume (Roberts 2012a), borrows directly from the insights of planning theory (Bratman 1987), and, like Charlow's plans of the interlocutors, is richer and more complexly organized than Portner's ToDo lists, so is consistent with the rich variety of modal flavors displayed by imperatives. In the course of interpretation of an imperative, the ordering source g both draws from the interlocutors' evident goals and priorities in G to contribute to the imperative's realization conditions (as we saw in the examples worked out in Section 2.2), and is in turn enriched by that proffered content when a direction is accepted. This dynamic interaction is parallel to the way that the common ground CG both bears on and is enriched by the interpretation of a declarative assertion, and with the way the QUD both constrains the interpretation of and is updated by an accepted question.

- The proposed account of imperative subjects in Section 4 offers new insights into the relevant linguistic data and an original way of utilizing Kaufmann's agreement feature to constrain the range of permissible sub-

jects and guarantee the attested realization conditions, in both matrix and embedded imperatives.

- The discussion of imperative subjects also brings out additional benefits of deriving their semantic content via abstraction over a subject indexed to the addressee: The result is an indexical property that is the appropriate sort of object of an intention, both because of its semantic type (cf. the usual locution for describing an intention: *intend to VP*), and because it is guaranteed to be *de se* (because of the addressee's special epistemic status as addressee) and intentions are always self-directed, constraining one's own behavior.

We have already seen some of the problems with Portner's and Kaufmann's accounts in Table 1 in Section 1. In the last row of the table are listed desiderata which proved problematic for those theories. In Section 3 we saw that in the present proposal, all these problems are overcome.

Portner (2007: fn. 2) acknowledges that not all imperatives are actionable and says that because of these "the name 'To-Do List' is a bit inaccurate; it would be more accurate to call it the 'To-Make-True-of-Me List'." Still, without a modal in the semantic content of an imperative, he cannot bring the interlocutors' priorities to bear in a regular way on semantic content or the modality of imperatives, as the account in Section 2 does via the futurate modal base f and ordering source g. And he doesn't give To-Do the complex internal organization assumed for G in the scoreboard in Section 2.1, as in Charlow's (2011) plans.

The central difference between Kaufmann's account and that presented here is her assumption that an imperative denotes a proposition. I take this to be conceptually problematic, as suggested in the introduction: The attitude we adopt toward a directive is that of an intention, and we do not intend propositions: We intend to do things, to realize properties. The empirical problems in Kaufmann's otherwise excellent account, as noted in Table 1, arise from this aspect of her theory, and from the fact that she would capture the deontic implications of directives in the semantics, rather than pragmatically as in the present proposal.

In several respects, Charlow's (2011, 2014, 2018) theory is conceptually quite similar to the account proposed here. He includes a modal in the semantic content, though like Kaufmann, his is a deontic modal, so encounters the same problems noted for her with desiderata (g) and (h). But he differentiates the semantic type of an imperative clause from that of clauses in other grammatical moods, so that they are not propositional, taking the semantic content to be a property of plans. He uses the term *plan* to denote a set of propositions, like

the value of the ordering source g at any given circumstance of evaluation in Kaufmann's/our account. The value of that function is also correlated with a preference ordering over worlds: Worlds which realize more of those propositions are ranked higher than others. So a property of a plan is a function from plans to propositions: "the property a plan has when it is in line with how the imperative tells the agent to plan". In our terms, if the proposition resulting from the addressee realizing the imperative is among those characterizing the addressee's ideal plan — something they intend to realize as given by g, then it is "in line with" that plan. Thus, whereas in (54) or (67) we effectively abstract on the subject of a modal proposition to derive a property (targeted to the addressee), Charlow starts with the modal proposition and abstracts on the ordering source presupposed by the modal. Though he doesn't offer a dynamic pragmatics, one could readily adopt something like ours in Section 2.1; Charlow (2011) offers a sophisticated characterization of the ways that plans and priorities are organized and how this comes to bear on the attested flavor of a given direction, one compatible with my understanding of G. And unlike Portner, he does not assume that the plans in question are always actionable, leaving room for "soft" imperatives like invitations and idle inquiries. Finally, though Charlow (2011) assumes that quantificational subjects can scope over illocutionary force (discussed and criticized in Section 4, above), if willing to give that up, he could just as well adopt the Force Linking Principle (56).

However, I question Charlow's derivation of the semantic content of a clause containing a modal operator by abstraction on the ordering source g. g is a presupposed parameter of evaluation rather than a syntactically subcategorized argument of a modal; hence I take it to be non-semantic, used to retrieve a speaker's presupposition. It strikes me as linguistically implausible to derive the semantic content of a clause-type by abstracting on a lexically presupposed parameter for interpretation of one of its sub-constituents. Also, as noted above, by abstracting on the addressee-indexed subject, the present account offers up a semantic content that seems to be the appropriate sort of object of an intention. Charlow could *stipulate* the resulting indexicality and the *de se* character of the content, but I don't see how it would fall out naturally, as on the present account.

There are, of course, many other linguistically-informed theories of the imperative worthy of careful consideration. Among recent work I note the following: Han (1998) is notable for its cross-linguistic emphasis. And Condoravdi & Lauer (2012) offer an excellent account of performative speech acts; see Roberts 2018 where I adopt their view of these and discuss its implications for speech

act theory. Barker (2012) takes imperatives to denote actions. The current account verifies the underlying intuition: but instead of *denoting* actions, here (non-expressive) imperatives are used to *propose* actions: the realization of the denoted *property*.

Han (1998), Truckenbrodt (2006), Condoravdi & Lauer (2012), Krifka (2014, 2024), Starr (2020), and Moltmann (2021) all build illocutionary force into semantic content at LF, e.g. into a functional head. For this, Starr (2020: Section 2) offers the most compelling arguments. But Starr fails to observe certain features of their crucial data. For example, in (71) they take the *if*-clause to have wide scope over the imperative in the second conjunct:

(71) If Chris tries to leave, I'll distract him and you close the door!
[Starr 2020]

The entire conjunction is a proposal to the addressee for how the interlocutors should behave if Chris leaves. But on an account where the imperative has its own modal force, we can get the attested interpretation via modal subordination: The first conjunct in (71) is *if Chris tries to leave, I'll distract him*, the modal base enriched by the *if*-clause; the modal in the imperative 2nd conjunct takes as part of its modal base that of the first conjunct, a commonly observed pragmatic accommodation that yields the attested reading without wide scope of the *if*-clause. The example is still interesting because it involves a conjunction with mixed mood: a (conditional) declarative and an imperative. But it isn't evidence of a conditional scoping over mixed mood conjuncts.

Generally for conjoined and disjoined examples with mixed mood: All the felicitous examples offered by Starr (and others I know from the literature), including (71), are used by the speaker to propose complex joint plans, typically involving the speaker and addressee (72) (effectively exhortative), but sometimes involving a 3rd person (73), with either conjunction (71)/(73b) or disjunction (72a)/(73a):

(72) [At a used book sale, trying to decide with one's partner what to buy, since we don't have enough money for all the books we've chosen:]
   a. *Me*: Put back *Waverly* or I'll put back *Naked Lunch*. I don't care which.
   b. *You*: I'm fine with either too. [Starr 2020]

(73) [Mom talking to one of two kids squabbling over a toy:]
   a. Give Chris back his toy or he can take one of yours. I don't care which.
   b. Apologize to Chris and he can decide whether to accept your apology.

Crucially, I don't know of any other types of (non-conditional) readings with mixed imperative and declarative mood. In each of (71)–(73), it seems important that the speaker is proposing joint plans: i.e., that the addressee and other party cooperate to carry out the relevant actions (conjunction) or to decide which alternative to realize (disjunction). In general, conjuncts/disjuncts must address the same QUD (Roberts 1989). In these examples, the proposed plans address a single decision problem, where a decision problem can be modeled as a question (Kaufmann & Kaufmann 2012): the QUD is how to keep Chris from leaving (71), which books to get (72), how to stop squabbling (73). And because the problem is joint, so is the plan for action. The declarative con-/disjunct in these examples, like an exhortative, proposes an (additional or alternative) plan, rather than making an assertion.

In support of this understanding, note that *and* and *or* are often used as discourse connectives, rather than as Boolean operators in the logical form of a single utterance. And this use is severely constrained by coherence of the resulting text.[20] We see this in the use of *and* and *or* in (74):

(74) [Two roommates are planning their shopping. One says:]
You go get the vegetables at the farmer's market. Oh, *and* buy some bucatini at Milano's on the way home. I'll get the milk.
[addressee looks overwhelmed]
Or stay home and finish your work here. OK? *And* I'll go to Milano's later when I go to the bookstore. We can get the veggies at Union Square tomorrow.

As in (71)–(73), the speaker in (74) proposes two alternative plans: One plan is outlined in the first three utterances; then *or* is used to introduce an alternative to the first plan. That is, here *or* effectively has "scope" over three utterances prior and three after its utterance. In the specification of each of the two complex plans (one sketched before, the other after *or*), *and* is used to give cohesion — indicating continuation of the specification of a plan. Each plan is one possible answer to the QUD of how to get the shopping done. There is no compositional semantics that can adequately address such uses of conjunction.

20 Asher (2007: 212) also takes the connectives in examples like Starr's to have a non-Boolean, discourse function, and notes that they are constrained by discourse coherence. But so far as I know, no one has previously noted that all the parts of a complex sentence with mixed force have to address the same decision problem, a joint problem for the agents targeted in the different disjuncts/conjuncts.

And I claim that the conjunction and disjunction in examples like (71)–(73) is of this sort.

Starr assumes that the challenge is "to interpret these constructions without positing ambiguous connectives and without blurring the differences between imperatives and declaratives," and argues that only an account that assumes a dynamic semantics, wherein the contextual update (and hence illocutionary force) associated with grammatical mood is part of the semantics, can meet this challenge. But since all of the data they consider is of the sort reviewed just above, I do not think they have made their point. Arguably, the account offered here does a better job than the previous literature of explaining the tight constraints on occurrence of conjoined/disjoined examples with mixed force, without assuming that imperative mood takes narrow scope under logical connectives.

6 Conclusions and prospects

In the preceding sections I have emphasized the empirical superiority of the account proposed in Sections 2 and 4 above. Here I would emphasize some respects in which the present approach offers certain theoretical advantages.

The assumption that the difference between the clause types is grounded in their differing semantic types is an elegant alternative realization of the intuition underlying the use of force operators in logical form from Frege till today, which is that there is some kernel content in common between sentences like those in (75), and that the basic content is that observed in the declarative (75a):

(75) a. You will finish your paper.
b. Will you finish your paper?
c. Finish your paper!

We capture Frege's intuition by deriving the content of the interrogative in (75b) and that of the imperative in (75c) from that of the declarative in (75a) by abstraction: In (75b) we abstract over the polarity in (75a) to derive a set of propositions — (75a) and its negation — reflecting the alternative values for a yes/no question. With a *wh*-question like *What will you finish?*, we would instead abstract over the *wh*-element to derive a set of propositions differing in the value of the object. In the imperative (75c) we abstract over the indexical subject to yield an indexical property.

As encoded in Portner's Force Linking Hypothesis, these abstracted contents play distinct natural roles in discourse: If accepted, each updates one of the three

central elements of a context of utterance—CG, QUD and G. In turn, the latter play different functions in dynamic interpretation and represent different kinds of attitudes that play a central role in the exchange of linguistic information: belief, inquiry, and intention. The natural object of belief is a proposition, that of inquiry is a question (set of alternative possibilities), and that of intention is a self-directed property. Correspondingly, we find that the three central types of speech acts call forth different responses: the assertion of a proposition is to be evaluated for truth; a question is posed with a view to inquiring into its resolution; and issuance of a direction calls for adoption of an intention to realize the indexically targeted *de se* property.

On such a view of the content and function of an imperative, the modality I have argued we find in the semantic content of an imperative clause like (75c) is a natural reflection of the essential future orientation of an intention. We find the same futurate modality in (75a) and (75b) — on a modal view of the future, all these clauses will involve the kind of modal relation we see in the imperatives. It's just that imperatives are always futurate. This constraint follows not from any stipulation about their LF, but from their pragmatic function: intentions can only be realized in the future.[21]

As noted above, it is ultimately important to see how the present proposal can be realized in a satisfactory logic of imperatives and consider how it bears on our judgments of semantic relations between imperative utterances, and between directives and assertions. Important in this respect is the treatment of free choice disjunction and Ross' paradox in imperatives, about which no consensus has as yet arisen. See Portner; Mastop; Charlow; Champollion, Alsop & Grosu 2019; Harris 2022, and the extended literature cited in those papers for an idea of where things stand.

References

Abney, Steven. 1987. *The English noun phrase in its sentential aspect*. Cambridge, MA: Massachusetts Institute of Technology dissertation. https://doi.org/1721.1/14638.

Arbini, Ronald. 1969. Tag-questions and tag-imperatives in English. *Journal of Linguistics* 5(2). 205–214. https://doi.org/10.1017/S0022226700002243.

21 In some languages (e.g. French) we find a past subjunctive imperative. But I take it these are effectively counterfactual, with a future orientation relative-to-some counterfactual past time. See also Mastop's (2011) Dutch counterfactual imperative.

Asher, Nicholas. 2007. Dynamic discourse semantics for embedded speech acts. In Savas L. Tsohatzidis (ed.), *John Searle's philosophy of language: Force, meaning and mind*, 211–243. New York: Cambridge University Press. https://doi.org/10.1017/CBO9780511619489.011.

Bar-Hillel, Yehoshua. 1971. *Pragmatics of natural language*. Dordrecht: Reidel. https://doi.org/10.1007/978-94-010-1713-8.

Barker, Chris. 2012. Imperatives denote actions. *Sinn und Bedeutung (SuB)* 16(1). 57–70. https://ojs.ub.uni-konstanz.de/sub/index.php/sub/article/view/410.

Barwise, Jon & Robin Cooper. 1981. Generalized quantifiers and natural language. *Linguistics and Philosophy* 4(2). 159–219. https://doi.org/10.1007/BF00350139.

van Benthem, Johan. 1983. Determiners and logic. *Linguistics and Philosophy* 6(4). 447–478. https://doi.org/10.1007/BF00636286.

van Benthem, Johan. 1984. Questions about quantifiers. *Journal of Symbolic Logic* 49(2). 433–466. https://doi.org/10.2307/2274176.

Bratman, Michael E. 1987. *Intention, plans, and practical reason*. Cambridge, MA: Harvard University Press.

Cariani, Fabrizio. 2021. *The modal future: A theory of future-directed thought and talk*. New York: Cambridge University Press. https://doi.org/10.1017/9781108668514.

Cariani, Fabrizio & Paolo Santorio. 2018. *Will* done better: Selection semantics, future credence, and indeterminacy. *Mind* 127(505). 129–165. https://doi.org/10.1093/mind/fzw004.

Champollion, Lucas, Anna Alsop & Ioana Grosu. 2019. Free choice disjunction as a rational speech act. *Semantics and Linguistic Theory (SALT)* 29. 238–257. https://doi.org/10.3765/salt.v29i0.4608.

Charlow, Nate. 2010. Restricting and embedding imperatives. In Maria Aloni, Harald Bastiaanse, Tikitu de Jager & Katrin Schulz (eds.), *Logic, language, and meaning: 17th Amsterdam Colloquium, Amsterdam, The Netherlands, December 16-18, 2009. Revised selected papers* (Lecture Notes in Computer Science (LNAI) 6042), 223–233. Berlin: Springer. https://doi.org/10.1007/978-3-642-14287-1_23.

Charlow, Nate. 2011. *Practical language: Its meaning and use*. Ann Arbor, MI: University of Michigan dissertation. https://doi.org/2027.42/89709.

Charlow, Nate. 2014. Logic and semantics for imperatives. *Journal of Philosophical Logic* 43(4). 617–664. https://doi.org/10.1007/s10992-013-9284-4.

Charlow, Nate. 2018. Clause-type, force, and normative judgment in the semantics of imperatives. In Daniel Fogal, Daniel W. Harris & Matt Moss (eds.), *New*

work on speech acts, 67–98. Oxford University Press. https://doi.org/10.1093/oso/9780198738831.003.0003.

Condoravdi, Cleo & Sven Lauer. 2012. Imperatives: Meaning and illocutionary function. In Chris Piñon (ed.), *Empirical issues in syntax and semantics*, vol. 9, 37–58. http://www.cssp.cnrs.fr/eiss9/eiss9_condoravdi-and-lauer.pdf.

Crnič, Luka & Tue Trinh. 2009. Embedded imperatives in English. *Sinn und Bedeutung (SuB)* 13. 113–127. https://doi.org/10.18148/sub/2009.v13i1.517.

Egan, Andy, John Hawthorne & Brian Weatherson. 2005. Epistemic modals in context. In Gerhard Preyer & Georg Peter (eds.), *Contextualism in philosophy: Knowledge, meaning, and truth*, 131–168. Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780199267408.003.0006.

Ernst, Tom. 2000. Semantic features and the distribution of adverbs. *ZAS Papers in Linguistics* 17: *Approaching the grammar of adjuncts: Proceedings of the Oslo conference, September 22–25, 1999*. 79–97. https://doi.org/10.21248/zaspil.17.2000.41.

Farkas, Donka & Kim Bruce. 2010. On reacting to assertion and polar questions. *Journal of Semantics* 27(1). 81–118. https://doi.org/10.1093/jos/ffp010.

von Fintel, Kai & Sabine Iatridou. 2008. How to say *ought* in foreign: The composition of weak necessity modals. In Jacqueline Guéron & Jacqueline Lecarme (eds.), *Time and modality*, 115–141. Dordrecht: Springer. https://doi.org/10.1007/978-1-4020-8354-9_6.

von Fintel, Kai & Sabine Iatridou. 2017. A modest proposal for the meaning of imperatives. In Ana Arregui, María Luisa Rivero & Andrés Salanova (eds.), *Modality across syntactic categories*. New York, NY: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198718208.003.0013.

Gärtner, Hans-Martin. 2017. Root infinitivals and modal particles: An interim report. In Josef Bayer & Volker Struckmeier (eds.), *Discourse particles: Formal approaches to their syntax and semantics*, 115–143. Berlin: De Gruyter Mouton. https://doi.org/10.1515/9783110497151-006.

Geach, Peter T. 1958. Imperative and deontic logic. *Analysis* 18(3). 49–56. https://doi.org/10.1093/analys/18.3.49.

Giannakidou, Anastasia & Alda Mari. 2018. A unified analysis of the future as epistemic modality: The view from Greek and Italian. *Natural Linguistics and Linguistic Theory* 36(1). 85–129. https://doi.org/10.1007/s11049-017-9366-z.

Ginzburg, Jonathan & Ivan Sag. 2001. *Interrogative investigations: The form, meaning, and use of English interrogatives*. Stanford: CSLI Publications.

Han, Chung-hye. 1998. *The structure and interpretation of imperatives: Mood and force in universal grammar*. Philadelphia: University of Pennsylvania dissertation. https://doi.org/20.500.14332/37681.

Harris, Daniel W. 2022. Imperative inference and practical rationality. *Philosophical Studies* 179(4). 1065–1090. https://doi.org/10.1007/s11098-021-01687-0.

Hausser, Roland R. 1980. Surface compositionality and the semantics of mood. In John Searle, Ferenc Kiefer & Manfred Bierwisch (eds.), *Speech act theory and pragmatics* (Studies in Linguistics and Philosophy (SLAP) 10), 71–95. Dordrecht: Reidel. https://doi.org/10.1007/978-94-009-8964-1_4.

Heim, Irene. 1983. On the projection problem for presuppositions. *West Coast Conference on Formal Linguistics (WCCFL)* 2. 114–126. Reprinted as Heim 2002.

Heim, Irene. 2002. On the projection problem for presuppositions. In Paul Portner & Barbara Partee (eds.), *Formal semantics: The essential readings*, 249–260. Oxford: Blackwell. https://doi.org/10.1002/9780470758335.ch10.

Huddleston, Rodney. 1970. Two approaches to the analysis of tags. *Journal of Linguistics* 6(2). 215–222. https://doi.org/10.1017/S0022226700002619.

Johnsen, Lars G. 1987. *There*-sentences and generalized quantifiers. In Peter Gärdenfors (ed.), *Generalized quantifiers* (Studies in Linguistics and Philosophy (SLAP) 31), 93–107. Dordrecht: Reidel. https://doi.org/10.1007/978-94-009-3381-1_4.

Karttunen, Lauri & Stanley Peters. 1979. Conventional implicature. In Choon-Kyu Oh & David A. Dinneeen (eds.), *Presupposition* (Syntax and Semantics 11), 1–56. New York: Academic Press. https://doi.org/10.1163/9789004368880_002.

Katz, Jerrold J. & Paul M. Postal. 1964. *An integrated theory of linguistic descriptions* (Research Monographs 26). Cambridge, MA: MIT Press.

Kaufmann, Magdalena. 2012. *Interpreting imperatives* (Studies in Linguistics and Philosophy (SLAP) 88). Dordrecht: Springer. Revised version of Schwager 2006. https://doi.org/10.1007/978-94-007-2269-9.

Kaufmann, Magdalena. 2021. Imperatives. In Daniel Gutzmann, Lisa Matthewson, Cecile Meier, Hotze Rullmann & Thomas Ede Zimmermann (eds.), *The Wiley Blackwell companion to semantics*. Malden, MA: Wiley. https://doi.org/10.1002/9781118788516.sem067.

Kaufmann, Magdalena & Stefan Kaufmann. 2012. Epistemic particles and performativity. *Semantics and Linguistic Theory (SALT)* 22. 208–225. https://doi.org/10.3765/salt.v22i0.2635.

Kaufmann, Magdalena & Claudia Poschmann. 2013. Embedded imperatives and echo-questions: Empirical evidence from Colloquial German. *Language* 89(3). 619–637. https://doi.org/10.1353/lan.2013.0050.

Köylü, Yilmaz. 2021. An overview of the NP versus DP debate. *Language and Linguistics Compass* 15(3). https://doi.org/10.1111/lnc3.12406.

Kratzer, Angelika. 1981. The notional category of modality. In Hans J. Eikmeyer & Hannes Rieser (eds.), *Words, worlds and contexts: New approaches in word semantic*, 38–74. Berlin: de Gruyter. https://doi.org/10.1515/9783110842524-004.

Krifka, Manfred. 2014. Embedding illocutionary acts. In Tom Roeper & Margaret Speas (eds.), *Recursion: Complexity in cognition* (Studies in Theoretical Psycholinguistics (SITP) 43), 59–87. Berlin: Springer. https://doi.org/10.1007/978-3-319-05086-7_4.

Krifka, Manfred. 2024. Performative updates and the modeling of speech acts. *Synthese* 203(1). 1–31. https://doi.org/10.1007/s11229-023-04359-0.

Link, Godehard. 1983. The logical analysis of plurals and mass terms: A lattice theoretical approach. In Rainer Bäuerle, Christoph Schwarze & Arnim von Stechow (eds.), *Meaning, use, and interpretation of language*, 302–323. Berlin: de Gruyter. https://doi.org/10.1515/9783110852820.302.

Lyons, Christopher. 1999. *Definiteness*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511605789.

Malamud, Sophia A. & Tamina Stephenson. 2015. Three ways to avoid commitments: Declarative force modifiers in the conversational scoreboard. *Journal of Semantics* 32(2). 275–311. https://doi.org/10.1093/jos/ffu002.

Mastop, Rosja. 2005. *What can you do? Imperative mood in in semantic theory*. Amsterdam, the Netherlands: University of Amsterdam dissertation. https://eprints.illc.uva.nl/id/eprint/2045.

Mastop, Rosja. 2011. Imperatives as semantic primitives. *Linguistics and Philosophy* 34(4). 305–340. https://doi.org/10.1007/s10988-011-9101-x.

Mauck, Simon, Miok Pak, Paul Portner & Raffaella Zanuttini. 2005. Clause typing in imperatives: A cross-linguistic perspective. In Corinne Brandstetter & Dominik Rus (eds.), *Georgetown University Working Papers in Theoretical Linguistics*, vol. 4, 135–152. Washington, DC: Georgetown University.

Moltmann, Friederike. 2021. Truthmaking, satisfaction, and the force-content distinction. In Gabriele Mras & Michael Schmitz (eds.), *Force, content and the unity of the proposition*, 235–251. New York: Routledge. https://doi.org/10.4324/9781003105152-12.

Pak, Miok, Paul Portner & Rafaella Zanuttini. 2004. Deriving clause types: Focusing on Korean. In *Proceedings of the Linguistic Society of Korea 2004: Yonsei Institute of Language and Information Studies*, 359–368. Seoul: Hanshin Publishing Company.

Peters, Stanley & Dag Westerståhl. 2006. *Quantifiers in language and logic*. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199291267.001.0001.

Portner, Paul. 2004. The semantics of imperatives within a theory of clause types. *Semantics and Linguistic Theory (SALT)* 14. 235–252. https://doi.org/10.3765/salt.v14i0.2907.

Portner, Paul. 2007. Imperatives and modals. *Natural Language Semantics* 15(4). 351–383. https://doi.org/10.1007/s11050-007-9022-y.

Portner, Paul. 2011. Permission and choice. In Günther Grewendorf & Thomas Ede Zimmermann (eds.), *Discourse and grammar: From sentence types to lexical categories* (Studies in Generative Grammar 112), 43–68. Berlin: Mouton de Gruyter. https://doi.org/10.1515/9781614511601.43.

Portner, Paul. 2017. Imperatives. In Maria Aloní & Paul Dekker (eds.), *The Cambridge handbook of formal semantics*, 593–626. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781139236157.021.

Portner, Paul. 2018a. Commitment to priorities. In Daniel Fogal, Daniel W. Harris & Matt Moss (eds.), *New work on speech acts*, 297–316. Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780198738831.003.0011.

Portner, Paul. 2018b. *Mood*. Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780199547524.001.0001.

Potts, Chris. 2005. *The logic of conventional implicatures*. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199273829.001.0001.

Roberts, Craige. 1989. Modal subordination and pronominal anaphora in discourse. *Linguistics and Philosophy* 12(6). 683–721. https://doi.org/10.1007/bf00632602.

Roberts, Craige. 1996. Information structure in discourse: Towards an integrated formal theory of pragmatics, 1998 revision. In Jae Hak Yoon & Andreas Kathol (eds.), *Papers in semantics* (Working Papers in Linguistics 49), 91–136. The Ohio State University, Department of Linguistics. A revised version was published in Roberts 2012b.

Roberts, Craige. 2012a. Information structure: Afterword. *Semantics and Pragmatics* 5(7). 1–19. https://doi.org/10.3765/sp.5.7.

Roberts, Craige. 2012b. Information structure in discourse: Towards an integrated formal theory of pragmatics. *Semantics & Pragmatics* 5(6). 1–69. https://doi.org/10.3765/sp.5.6.

Roberts, Craige. 2017. Linguistic convention and the architecture of interpretation. *Analytic Philosophy* 58(4). 418–439. https://doi.org/10.1111/phib.12113.

Roberts, Craige. 2018. Speech acts in discourse context. In Daniel Fogal, Daniel W. Harris & Matt Moss (eds.), *New work on speech acts*, 317–359. Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780198738831.003.0012.

Roberts, Craige. 2023. The architecture of interpretation: Dynamic pragmatics and pragmatic competence. Beth Lecture at the 2022 Amsterdam Colloquium. http://www.asc.ohio-state.edu/roberts.21/Roberts.Architecture2023.

Rudin, Deniz. 2018. Rising imperatives. *Semantics and Linguistic Theory (SALT)* 28. 100–119. https://doi.org/10.3765/salt.v28i0.4408.

Salzmann, Martin. 2020. The NP vs. DP debate. why previous arguments are inconclusive and what a good argument could look like: Evidence from agreement with hybrid nouns. *Glossa: a journal of general linguistics* 5(1). 83. https://doi.org/10.5334/gjgl.1123.

Schmerling, Susan. 1982. How imperatives are special, and how they aren't. *Chicago Linguistic Society (CLS): Papers from the parasession on nondeclaratives* 18(2). 202–218.

Schwager, Magdalena. 2006. *Interpreting imperatives*. Frankfurt, Germany: University of Frankfurt dissertation.

Silk, Alex. 2022. Weak and strong necessity modals: On linguistic means of expressing "a primitive concept OUGHT". In Billy Dunaway & David Plunkett (eds.), *Meaning, decision, and norms: Themes from the work of Allan Gibbard*, 203–245. Ann Arbor, MI: Maize Books/ Michigan Publishing Services. https://doi.org/10.3998/mpub.9948199.

Stalnaker, Robert. 1978. Assertion. In Peter Cole (ed.), *Pragmatics* (Syntax and Semantics 9), 315–332. New York, NY: Academic Press. https://doi.org/10.1163/9789004368873_013.

Starr, W. 2020. A preference semantics for imperatives. *Semantics and Pragmatics* 13(6). 1–60. https://doi.org/10.3765/sp.13.6.

Thomason, Richmond H. 1984. Combinations of tense and modality. In Dov Gabbay & Franz Guenthner (eds.), *Handbook of philosophical logic: Volume 2–Extensions of classical logic* (Synthese Library (SYLI) 165), 135–165. Dordrecht: Reidel. https://doi.org/10.1007/978-94-009-6259-0_3.

Truckenbrodt, Hubert. 2006. On the semantic motivation of syntactic verb movement to C in German. *Theoretical Linguistics* 32(3). 257–306. https://doi.org/10.1515/TL.2006.018.

Veltman, Frank. 2018. Notes on imperatives (Compilation 2018). University of Amsterdam. Unpublished compilation of slides from various talks. https://staff.fnwi.uva.nl/f.j.m.m.veltman/papers/CompilationImp.pdf.

Zanuttini, Rafaella. 2008. Encoding the addressee in the syntax: Evidence from English imperative subjects. *Natural Language and Linguistic Theory* 26(1). 185–218. https://doi.org/10.1007/s11049-007-9029-6.

Zanuttini, Rafaella, Miok Pak & Paul Portner. 2012. A syntactic analysis of interpretive restrictions on imperative, promissive and exhortative subjects. *Natural Language and Linguistic Theory* 30(4). 1231–1274. https://doi.org/10.1007/s11049-012-9176-2.

Zanuttini, Raffaella & Paul Portner. 2003. Exclamative clauses: At the syntax-semantics interface. *Language* 79(1). 39–81. https://doi.org/10.1353/lan.2003.0105.

Craige Roberts
roberts.21@osu.edu