On the relation between verbal mood and sentence mood

Paul Portner
Georgetown University

Draft of October 26, 2016
(Lots of new work here; sorry about any mistakes.
Please seek permission before circulating or citing.
Comments and corrections welcome.)

1 Overview

This paper will proceed through four steps. I will first review some connections between verbal mood and sentence mood. These connections are well-known, but have only rarely been discussed in connection with semantic and pragmatic theories of mood. Second, I will identify and formalize some striking similarities between theories of verbal mood and sentence mood; doing this will allow us to see what the implicit "state of the art" in linguistic theory has to say about the relation between verbal mood and sentence mood. Though this state of the art has is in some ways quite revealing, it leads directly to the third step: identifying a problem which afflicts our understanding of the parallels between verbal mood and sentence mood, and therefore of these basic categories of mood themselves. The fourth part of the paper aims to outline some new ideas about mood which can solve this problem.

The problem which I aim to bring out concerns the relationship between the external and internal semantics of subjunctives, infinitives, and imperatives. By "external semantics", I refer to the role that the meaning of a given clause plays in its grammatical or discourse context. Subjunctives, infinitives, and imperatives typically have an external semantics related to **ordering** or **comparison**. For example, subjunctives and control infinitives are selected by predicates like 'want' or 'tell (to)' whose semantics concerns the relative ranking or priority of alternative possibilities. Similarly, imperatives function in discourse to specify which alternatives are ranked higher according to some deontic or other prioritizing ordering.

The external semantics of indicative clauses is quite different. There are several types of indicative clauses, both root and embedded. The most prominent distinction among them is between declaratives and interrogatives. Roughly speaking, declarative indicatives (whether

root or embedded) add to a body of information by distinguishing relevant from irrelevant alternatives, while interrogatives (whether root or embedded) divide up the relevant alternatives into subsets which represent acceptable target information states.

By "internal semantics", I refer to the meaning of the clause itself, including such broad features as its semantic type as well as specific ones like characteristic features of temporal semantics or thematic roles. For example, interrogatives are often argued to be of a higher type than declaratives (i.e. proposition sets or partitions). The internal semantics of imperatives is quite distinct from the other clause types; in many languages, the imperative subject must be second person and the temporal interpretation is future-oriented. The feature of internal semantics which is crucial in my argument here concerns *de se* and related concepts ("*de te*" and "*de nunc*"). Subjunctives, infinitives, and imperatives are closely associated with *de se* interpretations of their subject and tense arguments. I will argue that we can describe them as showing *de se* "by default", as opposed to *de se* in other clause types, which is optional and requires extra structure.

Putting the above points together, we can state the main contribution of this paper: we face **the comparison–*de se* puzzle**.

- The comparison–*de se* puzzle: Why do comparison and *de se* by default go together?

Existing theories of verbal mood and sentence mood have nothing to say about the puzzle, and for this reason it has important implications for our understanding of these topics. I will propose a framework for understanding the relation between verbal mood a sentence mood. The main hypotheses of this framework are as follows:

1. Comparative semantics is a symptom of the absence of full **contextual commitment**
2. Commitment is associated with semantic type:
    - Unsaturated clauses (clauses which denote a property or centered world proposition) represent information towards which there is not full commitment in the context (e.g., to-do lists, ordering sources, individual commitment slates).[1]
    - Saturated clauses represent committed information (e.g., common ground, modal base).
3. Unsaturated types give rise to *de se* by default.

[1]The inclusion of "commitment slates" in this list of non-committed bodies of information may be confusing. An individual's commitment slate is not committed information because the other participants in the dialogue do not necessarily agree upon the information. This notion of commitment slate will be important in what follows, and will be discussed in Section 5.

4. Therefore: Lack of commitment ⇒ unsaturated type ⇒ *de se*

Point 1 is modeled on the traditional division of labor between modal base and ordering source in ordering semantics Kratzer (1981), and further motivated by Rubinstein's work (Rubinstein, 2012, 2014; Portner and Rubinstein, 2013). Point 2 is motivated by the dynamic pragmatics theory of imperatives (Portner, 2004) and by recent work on ego-marking in Newari (Coppock and Wechsler, submitted; Wechsler and Coppock, 2016; Zu, to appear). Point 3 amounts to the claim that the traditional property theory of *de se* is correct for the cases of *de se* by default (Lewis, 1979; Chierchia, 1989), though possibly not for other varieties of *de se*. I will argue that putting these ideas together allows for an explanatory theory of why each clause type has the semantic and pragmatic functions that it does.

2 Patterns of connection between verbal mood and sentence mood

It is well known that there are many connections between verbal mood and sentence mood at the morphosyntactic and semantic levels. In this section, I will illustrate the types of connections which I wish to explain. In order to do this in a clear way, we need to begin with some definitions (from Portner, to appear):

- **Mood** is an aspect of linguistic form which indicates how a semantic content is used in the expression of modal meaning.
  - **Verbal mood** indicates how a clause is used in the computation of modal meaning within the compositional semantics of phrases that contain it (subsentential modality).
  - **Sentence mood** indicates how a clause is used to perform fundamental conversational functions within semantic/pragmatic theory (discourse modality).

It is a theory-depending question what these "fundamental functions" which define the sentence moods are, but we have a name for them: the SENTENTIAL FORCES. The main theories we need to look at to try to understand the nature of sentential force, and then of sentence mood, are classical speech act theory and dynamic semantics and pragmatics.[2]

[2]Relevant work within speech act theory includes Katz and Postal 1964; Sadock 1974; Searle 1975; Bach and Harnish 1979; Searle and Vanderveken 1985; Vanderveken 1990, 1991; Zaefferer 2007; Charlow 2011; Rett 2011; Kaufmann 2012; Krifka 2014. Relevant work within the dynamic approach includes Hamblin 1971; Gazdar 1979; Groenendijk and Stokhof 1990, 1991; Groenendijk et al. 1997; Aloni et al. 2007; Aloni and van Rooy 2002; Portner 2004; Groenendijk and Roelofsen 2009; Farkas and Bruce 2010; Roberts 2012; Starr 2013.

It is also important to distinguish sentence mood from the closely related category of clause type:

- **Clause types** are grammatically defined classes of sentences which correspond closely to sentence moods.

The fact that clause type and sentence mood are different concepts can be seen by considering the embedded interrogative in (1):

(1) Mi chiedo se ci siano corsi d'inglese. (Italian)
me wonder-1sg if there be.3PL.SUBJ courses of English
'I wonder whether there are English courses.'

The complement clause in (1) is of the interrogative clause type, but the fact that it is subjunctive means that it cannot be used as a root sentence to ask a question. So, according to the linguists' traditional use of the notion, it does not have any sentence mood.

Now we turn to the ways in which the categories of verbal mood and sentence mood are linked. In this paper, we will restrict our attention to languages which make the "Standard Average Western European"[3] distinction between indicative and subjunctive. Example (2) illustrates the obvious connection between indicatives, on the one hand, and declaratives and interrogatives, on the other.

- The declarative and interrogative sentence moods require indicative verbal mood.
    1. Root sentences of the declarative clause type have declarative sentence mood only when their verbal mood is indicative.
    2. Root sentences of the interrogative clause type have interrogative sentence mood only when their verbal mood is indicative.

(2) a. She smiled. (indicative verbal mood; declarative sentence mood)
b. Did she smile? (indicative verbal mood; interrogative sentence mood)

As we will see, root subjunctive clauses are interpreted quite differently.

Imperatives are closely related to infinitives and subjunctives, but in a more complex way than the relation between indicatives and declaratives/interrogatives. The first point is that directive predicates embed infinitives and subjunctives, and imperatives to the extent that a given language allows:

[3]I use this term loosely. Haspelmath (2001) does not consider the indicative/subjuctive distinction to be a feature of Standard Average European. See Thieroff and Rothstein (2010) for an informative survey of mood in European languages and Portner (to appear) for a more general discussion.

(3) a. Mother told Inho **to study**.

b. Il exige que tu **partes** maintenant.
he demand that you leave.SUBJ now
'He demands that you leave now.' (French, Mulder 2010)

c. Emma-ka Inho-eykey kongpuha-**la**-ko hasiess-ta.
mother-NOM Inho-DAT study-IMP-COMP said(HON)-DEC
'Mother told Inho to study.' (Korean)

In other words, infinitives, subjunctives, and imperatives are used to report the kinds of speech acts which imperatives perform. Of course, infinitives and subjunctives are used with non-directive predicates as well, but as we will see, for the most part these predicates have something in common with directives.

The next point is that in syntactic context in which the canonical imperative form is not allowed, infinitival and subjunctive verb forms are often used. For example, in Spanish the canonical imperative cannot be negated, and a verb form with subjunctive morphology is used instead:

(4) a. **Lée** lo!
read.IMP it
'Read it!' (Spanish, Han 1998)

b. No lo **leas**!
neg it read-2SG.SUBJ
'Don't read it!'

In Italian, we see both subjunctives and infinitives expressing imperative sentence mood. The negative imperative has the form of an infinitive, while the polite imperative has subjunctive verbal mood.

(5) a. **Siediti**!
Sit.IMP-you
'Sit!' (Italian)

b. Non **sedersi**!
neg sit-INF-you
'Don't sit!'

c. Si **sieda**!
self sit.SUBJ.2P
'Have a seat!' (polite)

The root subjunctives and imperatives in examples (4)-(5) are all traditionally thought of as forms of the imperative, but we also find root infinitives and subjunctives which are not standardly labeled "imperative". Even in these cases, the meaning is generally imperative-like. In (6a)-(6b), the infinitive/subjunctive is not in any obvious way triggered by a syntactic construction which disallows the imperative form, but their meaning is directive:

(6) a. Bitte von der Bahnsteigkante **zurücktreten**.
Please from the edge.of.the.track step.back.INF
'Please step back from the edge of the track!'
(German, Truckenbrodt 2006)

b. Que **vagin** passant un per un!
that go.PRS.SUBJ.3SG come.in-GER one by one
'Let them come in one by one!' (Catalan, Quer 2010)

Pak et al. (2015) call examples like these "no-addressee imperatives" because they can be used in a context with no specific addressee (as on signs) to prescribe the actions of any individual to whom they apply. As pointed out by Palmer (2001), other nonfinite forms, like the English gerund in (7a), can have similar meanings.[4]

(7) a. No **smoking** in the courtyard.
b. #Smoking in the courtyard!

This association between non-finiteness and the no-addressee meaning is not universal, however. For example, Hebrew directive infinitives requires a specific addressee (Aynat Rubinstein, p.c.).

These patterns raise a number of questions:

1. Why are both interrogatives and declaratives formed using indicative verbal mood?
   - What do declaratives and interrogatives have in common?
   - How do the distinct clause type semantics of declaratives and interrogatives combine with indicative (or the subjunctive)?
2. Why are imperatives formed using non-indicative verbal moods?
   - How are imperatives crucially different from declaratives and interrogatives?
   - How are they related to infinitives and subjunctives?

My goal is to develop a framework which will allow questions like these to be answered.

[4]The fact that the non-negative gerund cannot have a similar meaning is presumably related to the common prohibition on combining negation with the canonical imperative form, as see in Spanish and Italian above.

3 Towards a unified theory of core mood

There are significant parallels between current theories of verbal mood and sentence mood which might provide a basis for explaining some of the connections observed in the previous section. In this section, we will observe some of these parallels, and we will make precise how the theories are related by formalizing them in a simplified way within a single logical system. I call this a unified theory of "core mood", for the two kinds of paradigms which are uncritically labeled "mood" in the literature. I assume that other phenomena, like evidentiality and reality status, may count as mood in a more general sense as well.[5] The theory looks promising for explaining the connections between verbal mood and sentence mood outlined in Section 2, but it leads directly to the comparison-*de se* puzzle.

There are two main approaches to verbal mood in the semantics literature, what I call the **comparison-based theory** and the **truth-based theory**. The comparison-based theory develops the intuition that the subjunctive marks evaluativity, while the truth-based theory aims for a formalization of the traditional idea that indicative is a marker of "realis" meaning and the subjunctive of "irrealis". The discussion here will develop the comparison-based theory.[6] The key hypothesis of this approach is as follows:

- The subjunctive marks a modal semantics involving comparison between worlds.

This description of the subjunctive captures the fact that it is selected by directive predicates, noted above, as well as by desire predicates and causatives.[7]

The central idea of the comparison-based theory can be carried out in different ways. For example Giorgi and Pianesi (1997) propose that the subjunctive is selected by operators which have a non-null ordering source, while Villalta (2008) proposes that it is triggered by a semantics which compares the members of a set of alternative propositions indicated by focus. Below we will formalize this approach in a simplified way which facilitates comparison with the sentence mood.

[5]Faller (2002) and Murray (2015) analyze evidentals as closely related to sentence mood. I use the term "reality status" in the sense of Elliott (2000) and Mauri and Sansò (2012).

[6]Some key references for the truth-based theory are Farkas 1992b, 2003; Giannakidou 1997, 2015; Portner 1997; Quer 2001; Schlenker 2005 and Mari 2016. As discussed by Portner (to appear), this approach is best described as proposing that mood marks whether or not the marked proposition is *true in a designated set of worlds*, where different version of the approach identify the designated set differently. Note that some research on verbal mood combines insights from the two approaches, and under certain assumptions about the semantics of modality, they may be equivalent.

[7]It also accounts for the use of subjunctive by emotive factives in languages in those languages in which it is selected by them, like French, but the cross-linguistic variation in this class poses problems for both approaches; Farkas (1992b, 2003) tries to explain this variation. Nor does it cover the reportative subjunctive, as in German (Fabricius-Hansen and Saebø, 2004), though we may take comfort in the fact that reportative subjunctives are often assumed to represent a distinct "use" of subjunctive mood.

As mentioned in Section 2, there are also two main approaches to sentence mood in the literature, what we can call the **speech act theory approach** and the **dynamic approach**. The speech act theory approach to sentence mood analyzes sentence mood as some type of marking of illocutionary force.[8] While it is often assumed that sentence mood introduces illocutionary force *per se*, through some type of "force operator", there are many different ideas within this literature concerning the relation between mood and force. For example, Bach and Harnish (1979) and Harnish (1994) derive an illocutionary force potential (a set of compatible illocutionary forces) for each sentence mood, not a specific illocutionary force. Searle and Vanderveken (1985) and Vanderveken (1990, 1991) decompose illocutionary force into sub-compondents, and propose an association between sentences mood and one of these components, illocutionary point.[9]

The dynamic approach defines sentential force as a characteristic type of context-update. The prototype of sentential force in this way of thinking is Stalnakerian assertion, the update of the common ground. The dynamic approach will therefore define declararative sentence mood as that aspect (or those aspects) of linguistic form which indicates that a clause produces an assertion-update. Within the broader dynamic approach, we can distinguish dynamic semantics theories like those of Groenendijk and Stokhof (1990, 1991); Groenendijk et al. (1997); Aloni and van Rooy (2002); Aloni et al. (2007); Groenendijk and Roelofsen (2009) and Starr (2010, 2013) from dynamic pragmatics theories like those of Hamblin (1971); Stalnaker (1974, 1978); Gazdar (1979); Portner (2004) and Roberts (2012). (The difference between dynamic semantics and pragmatics will not be too relevant here, but see Portner, to appear, for discussion.)

In what follows, we will set aside speech act theory and focus on the dynamic approach to sentence mood. Specifically, we will work with a version of dynamic pragmatics with the following claims:

- The discourse context has an abstract structure in which it represents the interlocutors' factual commitments, open inquiries, and plans and priorities for action
- Each of the basic sentence moods characteristically updates one of the above. Specifically:
  - Declaratives update the factual commitments.

[8] Some basic references on the speech act theory approach to sentence mood are Katz and Postal 1964; Sadock 1974; Searle 1975; Searle and Vanderveken 1985; Vanderveken 1990, 1991; Zaefferer 2007; Charlow 2011; Rett 2011; Kaufmann 2012, and Krifka 2014.

[9] In this description of Bach and Harnish's and Searle and Vanderveken's proposals, I have both simplified greatly and imposed my senses of the terms "sentence mood" and "sentential force". See Portner (to appear) for a more careful discussion of how these scholars' work fits into the broader literature on sentence mood.

I should also note that some work classified here within the speech act theory approach, for example the proposals of Charlow (2011) and Kaufmann (2012), incorporates significant insights from the dynamic approach.

  - Interrogatives update the open inquiries.
  - Imperatives update the plans and priorities for action.

- These characteristic updates can be identified as the sentential force of the sentence mood.

This basic picture is common to most work in the dynamic tradition, though there are important differences. For example, while Stalnaker treats the factual commitments as mutual (the common ground), a line of work represented by Hamblin (1971); Gunlogson (2001); Farkas and Bruce (2010) and Portner (to appear) argues that we need to keep track of the individual commitments of each participant in a dialogue. Moreover, theories of sentence mood are often not very clear on the precise role of grammatical form in conversational update. For example, work in philosophy often assumes an abstract force-content logical forms $F(c)$, without worrying about the grammatical features which lead to postulating a specific F in a particular case. Our goal here, though, involves understanding the precise relation between verbal mood and sentential force.

3.1 The PPOSW framework

Our investigation of the relation between verbal mood and sentence mood will proceed by casting the theories of both witin a single, simplified framework. The basic formal construct of this framework is the partitioned, partially-ordered set of worlds, or PPOSW.[10,11]

- A partitioned, partially ordered set of worlds PPOSW is a pair $s = \langle p_s, <_s \rangle$, where:
  1. p_s is a partition of a set of worlds c_s, and
  2. $<_s$ is a pre-order over c_s.

The PPOSW will be used to model both the lexical semantics of verbs which select indicatives and subjunctives and the contextual updates associated with declaratives, interrogatives, and imperatives.

Next we describe our logic's semantics:

[10]The logical framework used here builds on Veltman (1996), van der Torre and Tan (1998), and Aloni and van Rooy (2002). It would be possible to produce the same analysis on the assumption that interrogatives denote inquisitive propositions (Ciardelli et al., 2013), rather than partitions.

[11]Starr's (2010; 2013) model of the discourse context is rather similar in its formal structure, and aims to capture some of the same intuitions about sentence mood. One particularly elegant idea in his work is that we can embed information about the common ground within the preference state. However, there are important differences between our approaches as well, mostly arising from my goal of understanding the relation between verbal and sentence mood and the hypothesis that the semantic and discourse functions of a clause are determined by its semantic properties.

- Sentences come in two types:
  1. Some denote partitions of a subset of W.
  2. Others denote a subset of W.
- We have two update functions:
  1. **Reduce** the partition: for any PPOSW s and sentence ϕ which denotes a set of pairs of worlds,
     $s \oplus \phi = \langle p_s \cap [\![\phi]\!]^s, <_s \rangle$.
     (a) When $s \oplus \phi$ shrinks c_s (the domain of p_s), we call it an **assertive update**.
     (b) When $s \oplus \phi$ subdivides the cells of p_s, we call it an **inquisitive update**.
  2. **Refine** the order:[12] for any PPOSW s and sentence ϕ which denotes a set of worlds,
     $s \star \phi = \langle p_s, <_s \circ [\![\phi]\!]^s \rangle$.

Note that only one update function is defined for any given sentence: if ϕ denotes a partition, its update is $\oplus$, but if it denotes a set of worlds, its update is $\star$. Therefore, we could define a general update operation $s + \phi$, which performs the type-appropriate update $s \oplus \phi$ or $s \star \phi$.

When ϕ denotes a partition, the relation between $[\![\phi]\!]^s$ and s determines whether the update is assertive or inquistive. However, if the partition is trivial in the sense being a single equivalence class, it will never result in an inquisitive update. Suppose that $[\![\phi]\!]^s = p \times p$, for some set of worlds p. Then $s \oplus [\![\phi]\!]^s$ will always be assertive. We call such a partition PROPOSITIONAL. In contrast, if $[\![\phi]\!]^s$ is a non-trivial partition, $s \oplus [\![\phi]\!]^s$ might produce an inquisitive update. We call such a partition INTERROGATIVE or a QUESTION.

It will also be useful to define two dynamic-semantics style modals:

- The basic necessity modals for a PPOSW s are:
  1. **Informational modal**: $[\![\Box_c \phi]\!]^s = 1$ iff $c_s \subseteq [\![\phi]\!]^s$
  2. **Preference modal**: $[\![\Box_< \phi]\!]^s = 1$ iff $\mathbf{max}_s \subseteq [\![\phi]\!]^s$

Note that the modals can only apply to ϕ which denotes a set of worlds. If we think of c_s and $<_s$ as a modal base and ordering source, $\Box_c \phi$ expresses simple necessity and $\Box_< \phi$ expreses human necessity (Kratzer 1981).

Now we will turn to applying the PPOSW framework to verbal mood and sentence mood. In this section, my intent is to formalize the key ideas of some existing theories of mood within this one formal system. This formalization certainly simplifies both the phenomena

[12] Veltman (1996): $<_s \circ p = \{\langle w, v \rangle : \ w <_s v$ and if $v \in p$, then $w \in p\}$

and the theories, but it is useful because it allows us to observe more clearly how the theories are related to one another. Once we see these relations, we will be able to undertake building better theories of verbal mood, sentence mood, and the connections between them.

3.2 The PPOSW framework applied to verbal mood

The PPOSW framework allows us to express the key insights of the comparison-based theory of verbal mood. For this purpose, the PPOSW models an individual's cognitive state:

- An agent a's **cognitive model** in situation e is a PPOSW $m(a, e)$ where:
  1. $c_{m(a,e)}$ = the set of worlds compatible with a's beliefs in e; and
  2. $<_{m(a,e)}$ = the ordering of worlds which represents a's desires in e.

We give the semantics of 'believe' and 'want' in terms of the cognitive model.[13]

(8) $[\![A \textit{ believe that } \phi]\!]^s = \{w : \exists e_w[[\![\Box_c \phi]\!]^{m(a,e)} = 1\}]$

(9) $[\![A \textit{ want } \phi]\!]^s = \{w : \exists e_w[[\![\Box_< \phi]\!]^{m(a,e)} = 1\}]$

An agent a believes ϕ in w iff there is a situation e in w such that a's beliefs in e entail ϕ. This is the standard analysis of belief as doxastic necessity. Similarly, a wants ϕ in w iff there is a situation e in w where the most-desired doxastically accessible worlds are all ϕ worlds.

According to the comparison-based theory of verbal mood, 'want' selects the subjunctive because its meaning makes use of comparison among worlds, as represented by the ordering $<_{m(a,e)}$. 'Believe' selects the indicative because its meaning only cares about the domain $c_{m(a,e)}$, not about the ordering. We can summarize this idea with the following principles:

- **Indicative principle**: If a clause ϕ is operated on by the informational modal, its form is indicative.
- **Subjunctive principle**: If a clause ϕ is operated on by the preference modal, its form is subjunctive.

In order to incorporate other verbs into the analysis, the PPOSW structure will need to be enriched, both with additional background sets or partitions, analogous to the belief-set $c_{m(a,e)}$, and additional orderings, parallel to $<_{m(a,e)}$.

[13] The notation of single quotes indicates the counterpart of this English word in whatever language or languages we are talking about. Hence, a statement about 'want' here is about the counterpart of *want* in any language in which it selects the subjunctive.

Note that definition of the cognitive model tells us nothing about the partition-structure $p_{m(a,e,)}$ of the PPOSW other than its domain $c_{m(a,e)}$. It only tells us that the domain is the set of worlds compatible with a's beliefs in e. The partition structure of $p_{m(a,e,)}$ would be used for the semantics of embedded interrogatives, and as far as I know, there are no explicit theories of verbal mood in interrogatives. Since our goal for now is merely to formalize the key insights of existing theories of verbal mood, we cannot put that partition structure to use. We do need a theory of verbal mood in interrogatives, though, as shown by the contrast in (10)-(11):

(10) Gli avevo chiesto se ci sono corsi d'inglese.
him have-1sg asked if there be.3PL.INDIC courses of English
'I asked him whether there are English courses.' (Italian; Zanuttini, p.c.)

(11) Mi chiedo se ci siano corsi d'inglese.
me wonder-1sg if there be.3PL.SUBJ courses of English
'I wonder whether there are English courses.'

Here we see that Italian *chiedere* takes the indicative when it means 'ask' but the subjunctive when it means 'wonder'. Intuitively, this is because 'wonder' means something like 'want to know', where 'want' triggers subjunctive.

The theory of verbal mood sketched here has been kept extremely simple so as to facilitate comparison with the theory of sentence mood, but it is important to acknowedge some of the problems which face this kind of comparison-based theory. We have to worry about the following, among many other empirical issues:

- Cross-linguistic variation in mood selection.
- Contextual variation in mood selection with a single predicate (Smirnova, 2012; Mari, 2016)
- Predicates which are intuitively comparative but take indicative: 'hope', 'promise', 'probable' (Portner and Rubinstein, 2013)
- Predicates which are intuitively non-comparative but take subjunctive: 'possible', 'necessary' (Portner and Rubinstein, 2013)
- Polarity subjunctives, i.e. subjunctives triggered by negation and other operators (Portner, 1997; Quer, 1998; Giannakidou, 2011)

3.3 The PPOSW framework applied to sentence mood

The PPOSW framework allows us to capture important ideas in the dynamic approach to sentence mood. Here we use the PPOSW to model the discourse context:

- A discourse context D is a PPOSW, where:
  1. p_D represents the common ground ($= c_D$) and questions under discussion; and
  2. $<_D$ represents addressee's to-do list.

This definition is far too simple, of course, and in the next section we will be forced to consider more sophisticated alternatives. However, this simplicity is helpful for purposes of bringing out the relation between verbal mood and sentence mood.

I assume that some root sentences denote partitions while others denote simple sets of worlds. Then the sentential force of a sentence ϕ in discourse context D is the update $D + \phi$, whichever of the following is defined:

- **Reducing updates**. If ϕ is a set of pairs of worlds, update D to $D \oplus \phi$:
  1. **Assertion**: Perform an assertive update of D to $D \oplus \phi$.
  2. **Asking**: Perform an inquisitive update of D to $D \oplus \phi$.
- **Refining** update. If ϕ is a set of worlds:
  - **Directing**: Update D to $D \star \phi$.

Now we can identify the contributions of the basic sentence moods:

- **Declaratives**: The sentential force of a declarative sentence is assertion.
- **Interrogatives**: The sentential force of an interrogative sentence is asking.
- **Imperatives**: The sentential force of an imperative sentence is directing.

This analysis fits well with the "compositional approach to sentence mood", that is the idea that sentential force is not encoded *per se* in syntax, but rather derived from the semantic properties of a sentence using general pragmatic principles of discourse interpretation. (Hausser, 1980; Huntley, 1984; Pendlebury, 1986; Wilson and Sperber, 1988; Portner, 2004, to appear; Lohnstein, 2007; Roberts, to appear).

Further, on standard assumptions about the sentence moods, we have some consequences concerning their semantic types:

- Root declaratives denote propositional partitions.
- Root interrogatives denote interrogative partitions.
- Imperatives denote sets of worlds.

3.4 The relation between verbal mood and sentence mood in the PPOSW framework

These sketches of analysis of verbal mood and sentence mood within the PPOSW framework show how very similar the theories of these two types of mood are. This degree of similarity motivates the idea that verbal mood and sentence mood have something in common, that is that they comprise a broader category of CORE MOOD. Moreover, at a general level, the analyses give some insight into why subjunctive verbal mood is related to imperatives. Subjunctives and imperatives both relate to the ordering of a PPOSW, either the desire-ordering of the cognitive model, in the case of subjunctives, or the preference ordering of the discourse context, in the case of imperatives. The relation between indicative verbal mood, on the one hand, and declarative and interrogative sentence moods, on the other, remains somewhat more unclear. They share the fact that they relate only to the partition component of the PPOSW, not the ordering. This may be the beginning of an insight. But matters are confused because we have treated embedded declaratives as denoting simple sets of worlds, but root declaratives and interrogatives as partitions.

We can streamline the relation between verbal mood and sentence mood if change the type of embedded declaratives and treat them as propositional partitions.[14] If we did this, we would have the following picture:

- Verbal mood
  1. Indicatives denote partitions of a set of worlds.
     (a) Indicative declaratives denote propositional partitions.
     (b) Indicative interrogatives denote interrogative partitions (i.e. questions).
  2. Subjunctives denote sets of worlds.
     (a) Subjunctive declaratives denote sets of worlds.
     (b) Nobody knows much about subjunctive interrogatives

[14] Lohnstein (2007) proposes a very similar analysis of the relation between declaratives and interrogatives. We will need to recast the semantics of 'believe' so that it can combine with a clause which dentoes a partition, rather than a set of worlds. This change is certainly feasible, since we can recover the set of worlds from a propositional partition.

- Sentence mood
    1. Indicative declaratives denote propositional partitions.
    2. Indicative interrogatives denote interrogative partitions.
    3. Imperatives denote sets of worlds.

This theory would treat all indicatives consistently as denoting partitions, and it would capture the connection between subjunctives and imperatives by saying that both denote sets of worlds, not partitions. We would then be able to explain such properties as the imperative-like function of root subjunctives by pointing out that their semantic type (set of worlds) triggers the refining update, which amounts to directive sentential force when applied to the discourse context.

4 The comparison–*de se* puzzle

The goal of the previous section was to highlight the ideas about the relation between verbal mood and sentence mood which can be derived from a comparison of existing theories. I think that the conclusion should be that this strategy can lead to a number of important insights. Now I would like to argue, though, that something crucial is missing. There is a further connection between verbal mood and sentence mood about which theories we have reviewed so far have nothing to say. The problem concerns *de se* semantics, and in particular the distribution of what I call "*de se* by default".

The following positions are determined to receive a *de se* interpretation by virtue of their clauses' tense and mood features. They are *de se* by default.[15]

1. The subject of a control infinitive
2. The temporal argument of an infinitive
3. The temporal argument of a subjunctive
4. The null subject of an imperative
5. The temporal argument of an imperative

[15] *De se* by default is not quite the same thing as obligatory *de se* (Anand, 2006; Pearson, 2013), since a type of pronoun which is always *de se* (no matter the type of clause it is in) would not be *de se* by default by this definition.

For example, it is well known that the null subject of an infinitival complement of 'want' must be interpreted *de se* (Chierchia, 1989). This point is clearer in languages with a robust opposition between infinitives and subjunctives, since in such languages the subjunctive must be used when the subject is not *de se*. (This is the OBVIATION EFFECT; Picallo 1985 Raposo 1986, Suñer 1986, Farkas 1992a, Tsoulas 1996, Avrutin and Babyonyshev 1997, Quer 1998, Kempchinsky 2009 Schlenker 2005, 2011.) The following data from Catalan shows the point (Quer 2009, p. 1789):

(12) a. No vull que saludis absolutament ningú. (Catalan)
neg want that say.hello.subj absolustely anyone
'I don't want you to say hello to anyone at all.'

b. No vull saludar absolutament ningú.
neg want say.hello.inf absolutely anyone
'I don't want to say hello to anyone at all.'

Standard theories of tense imply that the temporal arguments of infinitives and subjunctives are interpreted as temporal abstracts, leading to temporal *de se* (what is sometimes called "*de nunc*"). In the case of infinitives, this point is explicit in the literature (von Stechow, 1995, 2004; Giannakidou, 2009). In order to make the same point for subjunctives, two observations are needed. First, selected subjunctives are always tense-agreeing and "bound" by the matrix tense (as shown by Quer 1998, for example).[16] And second, a clause with bound tense is always interpreted as a temporal abstract (Abusch, 1988, 1997, 2004; Heim, 1994).[17]

Now we turn to imperatives. Example (13) shows a standard control infinitive, and here the speaker's utterance is true in the context where Mama is aware that her grandson is LLCJ, and false in the one where she is not. This shows that the infinitival subject is addressee-oriented *de se* ("*de te*") by default. Example (14) shows the same pattern of judgment with an embedded imperative.

(13) [*Mama tells James that her favorite rapper LLCJ should knock out his critics. She is/isn't aware that James is LLCJ. A third party describes this as:*]
His grandmother told him to knock them out.

(14) [*Mama tells James that her favorite rapper LLCJ should knock out his critics. She is/isn't aware that James is LLCJ. Later LLCJ addresses his critics:*]
Mama said knock you out. (the actual lyric)

[16]Other relevant data is given by Picallo (1984, 1985), Luján (1979, 1980), Pica (1984), Progovac (1993), von Stechow (1995).

[17]There is evidence that some tense-agreeing selecting subjunctives can receive a temporal *de re* interpretation in certain circumstances. The relevant cases are ones in which the subjunctive tense appears to be bound by an adverbial rather than the matrix tense.

Not all cases of *de se* interpretation are *de se* by default. The pronominal subject of an embedded indicative is optionally *de se*.

(15) Mary thought that she was pregnant.

The same goes for the tense argument of an embedded indicative. As is well-known, embedded tenses can have both a "simultaneous" and a "shifted" reading. The former is *de se* and the latter *de re* (Heim 1994, Abusch 1997).

I would like to suggest that we analyze *de se* by default and optional *de se* differently. Specifically, I propose that *de se* by default occurs when an argument position is never saturated in the course of a semantic derivation. For example, the subject of a control infinitive would simply not saturate the predicate's external argument. This would to the infinitive denoting a property, as on Chierchia's analysis (but with a different derivation), and give *de se* meaning in the way originally described by Lewis (1979). In contrast, I propose that optional *de se* be analyzed as a special case of *de re*, in the manner proposed by Maier (2010).[18]

With this notion of *de se* by default, we can state the puzzle:

- Why do those clauses which are used to produce a modal semantics of comparison have arguments which are *de se* by default?

Specifically, why do imperatives, infinitives, and subjunctive, which are interpreted with respect to the order $<_s$ of a PPOSW, determine a default *de se* semantics for their subject and/or temporal arguments?

5 Semantic type, comparison, and commmitment

The comparison-based theory of verbal mood and the dynamic approach to sentence mood can be linked using the PPOSW framework to produce an insightful theory of the broader concept of mood — what I've called "core mood". However, this unification does not account for the similarities in internal semantics of imperatives, infnitives and subjunctives. We need an idea which allows an explanation for why clauses which have an argument intepreted as *de se* by default are used talk about or update the preference component of a PPOSW. I will develop a framework in which the semantic type of *de se* clauses leads to their being interpreted with respect to a contextually relevant ordering.

[18] Anand (2006) advocates a similar approach. Park (2016) argues for a split approach to *de se* in Korean, applying the property theory to the reflexive *caki* and the *de se*-as-*de re* theory to control PRO. I am proposing the opposite here, with with the control clause denoting a property.

5.1 Background: ego-marking

The approach I will propose draws some crucial insights from recent work on ego-marking in Kathmandu Newari (Wechsler and Coppock, 2016; Coppock and Wechsler, submitted; Zu, to appear) EGO-MARKING refers to a subject agreement form; in root clauses, the ego-marking form occurs in first person declarative sentences and second person interrogative sentence. (It is glossed as CONJ, for "conjunct", because of how it functions in embedded clauses.)

(16) a. jĩ: a:pwa twan-ā
1.ERG much drink-PAST.CONJ
'I drank a lot.'

b. jĩ: a:pwa twan-a lā
1.ERG much drink-PERF Q
'Did I drink a lot?'
(Newari, Hargreaves 2005 cited by Coppock and Wechsler 2015)

(17) a. chã a:pwa twan-a
2.ERG much drink-PERF
'You drank a lot.'

b. chã a:pwa twan-ā lā
2.ERG much drink-PAST.CONJ Q
'Did you drink a lot?'

In embedded clauses, it represents a kind conjunct agreement or non-switch-reference marker, in that (roughly speaking) the ego-marking (conjunct) form appears in an embedded clause when its subject is coreferential with the matrix subjunct. Coppock and Wechsler and Zu show that ego-marked embedded clauses are obligatorily *de se*. In our terms, they can be viewed as *de se* by default, since this interpretation is determined by the verbal form (data from Zu to appear, (19)).

(18) [*Scenario: a teacher saw a giant pile of paper in the corner of his office. He thought his assistant graded them, when in fact he himself was the one who did the grading. He pointed at that pile of paper and told a colleague, "The grader worked very hard."*]

a. #guru dhāl-a ki [wa parisram yan-ā]. (Newari)
teacher say-PST.DISJ that s/he work.hard do-PST.CONJ
'The teacher$_1$ said that he$_1$ worked hard.'

b. guru dhāl-a ki [wa parisram yat-a].
teacher say-PST.DISJ that s/he work.hard do-PST.DISJ
'The teacher$_1$ said that he$_1$ worked hard.'

In Coppock and Wechsler's analysis, the semantics of ego-marking results in the clause being interpreted as a centered proposition, i.e. a set of individual-world pairs, centered on the "epistemic authority" which corresponds to the subject. This semantic type allows them to adopt Lewis's property theory of *de se*.

Coppock and Wechsler have an insightful idea about the discourse function of ego-marked root clauses like (16)-(17). They adopt a framework of discourse meaning in which the individual interlocutors' commitments are represented as "commitment slates" separate from the mutual commitments of the dialogue, the common ground (following Farkas and Bruce 2010; see also Hamblin 1971,Gunlogson 2001, Portner to appear). To this framework, they add the novel idea that commitment slates are not sets of ordinary propositions, as has been assumed previously, but rather sets of centered propositions. Each individual x's commitment slate cs_x is a set of propositions centered on x. In other words, it is encoded within centered proposition which individual's commitments it represents. This means that, when an ego-marked declarative like (16) is used, its sentential force can be read off of its semantic value: within Coppock and Wechsler's theory, the sentential force of an ego-marked declarative is to update the commitment slate of the individual on whom its denotation is centered.[19] As a default, when a centered proposition is added to an individual's commitment slate, the corresponding uncentered proposition is added to the common ground. This step corresponds to the mutual acceptance of information to which the speaker makes an individual commitment.

5.2 Ego-marking in the PPOSW framework

From Coppock and Wechsler's work, I will adopt the central idea that individual discourse commitments are represented using centered denotations. However, I wish to preserve the insights about the relation between verbal mood and sentence mood developed in Section 3, and so I will not adopt their assumptions about the semantic types of declaratives and interrogatives. Instead, I will divide things up as follows:

- Partitionhood
    1. Indicative declaratives and interrogatives denote partitions.
    2. Non-indicatives denote lower-type sets.
- Centering
    1. Ego-marked clauses' meanings are centered on the epistemic authority.

[19]Note that in their theory, questions are sets of centered propositions, but the discourse structure does not have distinct "question slates" for each participant. Rather there is a single, mutual question set, the Table, which can contain questions centered on various individuals.

2. Imperatives' meanings are centered on the addressee and a time.
3. Subjunctives' meanings are centered on a time.
4. Control infinitives' meanings are centered on an individual and a time.

Putting these points together, we get the following semantic types for some key constructions:

- A non-ego-marked indicative declarative or interrogative denotes a partitions of a set of worlds.
  1. The declarative's partition is propositional.
  2. The interrogative's partition is interrogative.
- An ego-marked indicative declarative or interrogative denotes a partition of a set of individual-centered worlds, where the individual is the epistemic authority.[20]
  1. The declarative's partition is propositional.
  2. The interrogative's partition is interrogative.
- An imperative denotes a set of individual/time-centered worlds, where the individual is the addressee.[21]
- A subjunctive denotes a set of time-centered worlds.
- A control infinitive denotes a set of individual/time-centered worlds.

One pattern I don't take a stand on is the subjunctive interrogative (11). By the internal logic of the system, subjunctive interrogatives ought to denote interrogative partitions of a set of time-centered worlds.[22] That would imply that they have something in common with indicatives, namely partitionhood. Perhaps in reality there are two kinds of subjunctives: infinitive-like ones (time-centered sets of worlds) and indicative-like ones (time-centered partitions). The latter type would be appropriate for subjunctives not tiggered by the semantics of comparison, such as reportative subjunctives, and closely related to ego-marked clauses in

[20]Steve Wechsler points out that the ego-marking form is historically related to an infinitive marker, and so it may be that the partitions associated with ego-marked clauses are also time-centered (i.e. individual/time-centered partitions).

[21]This analysis of imperatives is virtually equivalent to those which assign it the type of a property (Hausser, 1980; Portner, 2004, 2007). Ideally we would be able to identify the addressee in imperatives in a way similar to the epistemic authority relevant to ego-marking (the speaker in ego-marked declaratives and the addressee in ego-marked interrogatives). The agent of an action is in some sense the "authority" for that action.

[22]Wh-infinitives would raise the same issues. As noted above, my intuition about 'wonder' is that it means 'want to know' and that the subjunctive is triggered by the desire component.

Newari.[23] Indeed, it does seem reasonable to relate reportative subjunctives and ego-marked clauses, in that both can be thought of as updating someone's commitment slate.

5.3 The model: extension of the logical framework

We need a formal model which can incorporate the contributions of both centered and uncentered meanings at the partition-level and lower-level types. To this end, we will allow both partitions of sets of worlds, and partitions of sets of centered worlds. At the same time, we are going to allow for the possibility of tracking multiple ordering relations at once. So our two structures will be the PMOSW ("partitioned, multiply ordered set of worlds")[24] and the PMOSCW ("partitioned, multiply ordered set of centered worlds").

- A PMOSW $s = \langle p_s, <_{1,s}, <_{2,s}, \ldots \rangle$, where
  1. p_s is a partition of a set of worlds c_s, and
  2. Each $<_{n,s}$ is a partial ordering of c_s-worlds.
- A PMOSCW $s_i = \langle p_{s_i}, <_{1,s_i}, <_{2,s_i}, \ldots \rangle$, where
  1. p_{s_i} is a partition of a set of i-centered c_{s_i} worlds, and
  2. Each $<_{n,s_i}$ is a partial ordering of i-centered c_{s_i}-worlds.

In what follows, the only type of centered worlds we will consider are those centered on an individual. We will not incorporate time-centered worlds into the model, even though we need them to analyze subjunctives. Nor will we incorporate worlds centered on an individual/world pair into the model, though these are needed to account for the temporal semantics of infinitives and imperatives. The reason for this gap is simply that I do not yet fully understand the role played by time in the discourse context and agent's cognitive model.

Next we define both the discourse context and an agent's cognitive model using the constructs PMOSW and the PMOSCW.

- The DISCOURSE CONTEXT D is a set $\{m, cs_1, \ldots, cs_n\}$, where:
  1. The mutual commitment slate m is a PMOSW,
  2. Each individual commitment slate cs_i is a PMOSCW, and

[23] ECM infinitives would presumably be quite similar to the second class of subjunctives.

[24] It could be called the "partitioned, multiply partially ordered set of worlds", but in my opinion that would be taking the spirit of trying to avoid overselling the system's elegance too far.

3. The set of PARTICIPANTS in D is the set of individuals i on which some cs_i is centered.

Within D, the common ground and shared priorities are encoded in the mutual commitment slate m and in addition each of the participants has an individual commitment slate cs_i

- An individual a's COGNITIVE MODEL in situation e is a PMOSCW centered on a, where:
  1. The domain of the partition $c_{m(a,e)}$ represents a's beliefs in e, and
  2. Each of the orderings $<_{n,m(a,e)}$ represents a type of priority for a in e.

We will assume that there is only one ordering in the cognitive model $<_{1,m(a,e)}$ and that it represents a's desires in e. We can refer to it as $<_{des(a,e)}$. As before, we ignore the partition structure in $m(a,e)$ because it is meant to model the individual's private inquiries — roughly what she wonders or is interested in knowing. We won't use this piece in our analysis until we understand interrogative subjunctives better.

Since we have enriched our ideas about the discourse context and cognitive model to include multiple orders and centered objects, we need to adjust the definitions of the update operations.

- **Reduce**: For any PMOSW or PMOSCW s and sentence ϕ which denotes a partition matching s in the identify of its center (if any),
  $s \oplus \phi = \langle p_s \cap [\![\phi]\!]^s, <_s \rangle$.
  1. When $s \oplus \phi$ shrinks c_s (the domain of p_s), we call it an **assertive update**.
  2. When $s \oplus \phi$ subdivides the cells of p_s, we call it an **inquisitive update**.
- **Refine**: For any PMOSW or PMOSCW s and sentence ϕ which denotes a set of worlds or centered worlds matching an order $<_{n,s}$ in the identity of its center (if any),
  $s \star_n \phi = \langle p_s, <_{n,s} \circ [\![\phi]\!]^s \rangle$.
- **State update**: For any PMOSW or PMOSCW s and sentence ϕ, $s + \phi$ is whichever of the following are defined: $s \oplus \phi$ or $s \star_n \phi$, for some n.
- **Discourse update**: For any discourse context D and sentence ϕ, $D + \phi$ is whichever of the following are defined: for some $s \in D$, $s + \phi$.

State update seeks out some type-matching component of s and updates it with the appropriate version of $\oplus$ or $\star$. Discourse update seeks out some appropriate component of the

discourse and state-updates it. Note that both forms of update are now in principle non-functional relations, since it could be that there are multiple orders within the state, and it's ok for a non-partition ϕ to modify any of them. But we will not deal with such cases here.[25]

5.4 Individual commitment and contextual ordering

The formalization of the discourse context given above is similar to those of Hamblin (1971), Farkas and Bruce (2010), and related work, in that it has separate components for the mutual commitments and each individual's commitments. As discussed by Farkas and Bruce, Coppock and Wechsler (submitted), Portner (to appear) and others, there are relations between the mutual and individual commitments. One type of relation will follow from the general fact that the state of the discourse is itself mutual information; so, if having drunk a lot is on Sally's individual commitment slate, it should be in the common ground that Sally is individually committed to having drunk a lot. But beyond this type of thing, there are important relations which are intrinsic to the intended interpretations of the mutual and individual commitment slates.

In this section, I will try to formalize two principles which go under the slogan "individual commitments are soft mutual commitments". The first of these says that, if a participant in a conversation is committed to a belief p, all participants are licensed to talk as if p is more likely that $\neg p$. The second says that, if an individual is committed to a preference P, all participants are licensed to talk as if P is a better outcome that *not-P*. Often, an individual commitment goes from being a soft mutual commitment to a hard mutual commitment. This is the sequence seen when an individual expresses an opinion (individual commitment) that p, which other participants treat as evidence (soft mutual commitment) that p, before sooner or later (usually sooner) accepting p as a fact (hard mutual commitment).[26]

Coppock and Wechsler describe the first type of relation. They say that when an individual takes on a factual commitment by asserting an ego-marked clause, by default the uncentered proposition corresponding to the denotation of that clause will enter the common ground. For example, if Sally takes on an individual commitment to having drunk a lot, by default it will become common ground that she drank a lot. The reason for this relation is obviously that Sally's individual commitment to having drunk a lot counts as a good reason to believe that she drank a lot. In other words, there is a respect in which a world w in (one of the pairs in) c_{cs_i} is more likely than an otherwise similar world v not in (one of the pairs in) c_{cs_i} (it is more likely "in view of i's beliefs"). This likelihood relation is one of the orderings in

[25]The idea that there are multiple stores of prioritizing information in the context — multiple sub-to-do-lists — was explored by Portner (2007).

[26]This sequence of steps is very similar to what happens in Murray's (2014) theory of grammatical evidentiality, and I believe it would prove insightful to incorporate the chief ideas of her theory into the framework sketched here.

D.[27]

- If $cs_i \in D$, then one ordering relation in m is $<_{bel(i)} = \{\langle w, v\rangle : w \in c_{cs_i(i)}$ and $v \notin c_{cs_i(i)}\}$.

We can think of this as the individual commitments of i being treated as a type of evidence. The ordering $<_{bel(i)}$ can be merged with other likelihood orderings in m to produce a useful ordering source (Katz et al., 2012).

There are also relations between the ordering components of an individual commitment slate and the mutual commitments. Suppose that Sally expressed a preference to have a coffee, so that centered worlds in which has has a coffee are higher-ranked than otherwise similar centered worlds in which she does not, according to one of the orderings in her commitment slate. Then by default there will be a mutual preference in discourse that she gets her coffee. The relation between cs_i and m is as follows:

- If $cs_i \in D$ and $<_{n,cs_i} \in cs_i$, then one ordering relation in m is the uncentered ordering $<_{k,cs_i}(i)$.

The ordering $<_{k,cs_i}(i)$ can be used as a buletic ordering source, "in view of what i wants".

5.5 The semantics of verbal mood and the derivation of sentential force

The goal of this section has been to revise the theory of the relation between verbal mood and sentence mood presented in Section 3 so as to take into account the idea that saturated and unsaturated meanings (that is, uncentered and centered propositions or partitions) are specialized for different sematic roles. Now we return to some of the basic examples which illustrate the semantic functions of each sentence mood and verbal mood. The key idea is that the semantic type of each clause can drive the right interpretive process for both unembedded (sentence mood) and embedded (verbal mood) examples. In this section, I want to show that the idea works for the simplest range of examples: root declaratives, interrogatives, and imperatives used in their most literal way, embedded indicatives under 'believe', and embedded infinitives under 'want'.

[27] $cs_i(i)$ is the set of worlds w which are paired with i in cs_i. The notation is meant to suggest "uncentering" cs_i by applying it to i, as the operation is described by Coppock and Wechsler. Below I employ a similar notation $<(i)$ for the ordering which holds between two worlds w and v iff $\langle i, w\rangle < \langle i, v\rangle$.

Considerations of compositionality. We begin with the necessary hypotheses (not yet packaged as a formal fragment) about the internal semantics of mood:

- The core clausal constituent of simple sentences — let's call it vP — consists of the verb and its internal arguments. Its denotation is a property of individuals and times, or equivalently an individual/time-centered proposition.
- Imperative morphosyntax restricts the subject's argument to the addressee, but does not change the clause's type.
- Subjunctive saturates the subject argument but not the time argument. A subjunctive denotes a set of time-centered worlds.
- Indicative does two things:[28]
  1. It saturates both the individual and time arguments.
  2. It raises raises the clause's type to that of a propositional partition, mapping p to $p \times p$.

  As a result, an indicative denotes a propositional partition of a set of (uncentered) worlds.
- Wh-items subdivide the partition.[29] As a result, an indicative interrogative denotes an inquisitive partition of a set of (uncentered) worlds.

Examples. Some illustrative examples will show how these assumptions work with the definitions of discourse context and cognitive model to explain the relation between verbal mood and sentence mood. The idea is that in each derivation, we see the meaning of a clause drive the appropriate form of the update operation + to derive the correct sentential force (for root clauses) or subsentential modal meaning (for embedded ones).[30]

- **Root declarative.** The declarative denotes an uncentered partition and it therefore updates the partition component of the discourse's mutual commitments:

(19) $[\![\textit{Alice left}]\!]^c = [\lambda w \lambda v \,.\, \exists t_{\prec time(c)}[\text{ Alice leaves at } t \text{ in } w] \wedge \exists t_{\prec time(c)}[\text{ Alice leaves at } t \text{ in } v]]$

[28] It only does the second of these in Newari. Non-ego-marking (i.e. disjunct) agreement does the first. We may want to split these functions in other languages as well: Finite agreement saturates the individual and time arguments, while a separate mood component forms the partition.

[29] This is close to Lohnstein's (2007) analysis of the relationship between declarative and interrogative sentence mood. Alternatively, if we think the wh-item has scope under indicative, it would create a proposition set which indictive subsequently raises to an interrogative partition.

[30] The approach here is in some ways similar to that of Farkas (2003).

(20) $D{+}$[[*Alice left*]]^c:
Update p_{m_D} to $p_{m_D} \cap$ [[*Alice left*]]^c

- **Root interrogative.** The interrogative denotes an uncentered partition and it therefore updates the partition component of the discourse's mutual commitments:

(21) [[*who left*]]^c = $[\lambda w \lambda v$. $\{x : \exists t_{\prec time(c)}\ x$ leaves at t in $w\}$ =
$\{x : \exists t_{\prec time(c)}\ x$ leaves at t in $v\}]$

(22) $D{+}$[[*Alice left*]]^c:
Update p_{m_D} to $p_{m_D} \cap$ [[*Alice left*]]^c

- **Root imperative.** The imperative denotes a property of the addressee and it therefore updates an ordering component of the addressee's commitment slate.

(23) [[*Leave!*]]^c = $[\lambda x \lambda w\ :\ x = addressee(c)$. $\exists t_{\succ time(c)}\ x$ leaves in w at $t]$

(24) $D{+}$[[*Leave*]]^c:
Update some $<_{n,cs_{addressee(c)}}$ to $<_{n,cs_{addressee(c)}} \circ$ [[*Alice left*]]^c

- **Embedded infinitive.** The infinitive denotes a property, and it therefore constrains the subject's desires.

(25) [[*to leave*]]^c = $[\lambda x \lambda w$. $\exists t_{\succ time(c)}\ x$ leaves in w at $t]$

(26) [[*Bob wants to leave*]]^c =
$[\lambda w$. $\exists e_w\ m(a,e)$+*to leave*$= m(a,e)]$ =
$[\lambda w$. $\exists e_w\ m(a,e) \star$*to leave*$= m(a,e)]$

- **Embedded indicative.** The indicative denotes an uncentered partition, and it therefore cannot immediately update any component of the subject's cognitive model. It is shifted to the type of centered partition.

(27) [[*that Alice left*]]^c = $[\lambda x \lambda w \lambda v$. $\exists t_{\prec time(c)}[$ Alice leaves at t in $w] \wedge$
$\exists t_{\prec time(c)}[$ Alice leaves at t in $v]]$

(28) [[*Bob thinks that Alice left*]]^c =
$[\lambda w$. $\exists e_w\ m(a,e)$+*that Alice left* $= m(a,e)]$ =
$[\lambda w$. $\exists e_w\ m(a,e) \oplus$*that Alice left* $= m(a,e)]$ =
$[\lambda w$. $\exists e_w\ c_{m(a,e)} \subseteq$[[*that Alice left*]]$^c]$

The shift to centered partition would also allow for some pronoun in the clause to be bound, leading to an (optional) *de se* meaning.

In this framework, indicatives produce reducing updates, and those updates are inquisitive or assertive depending on whether the the clause denotes a propositional or an interrogative partition. In root clauses, the reducing update amounts to a sentential force of assertion or asking; in an embedded clause, it produces a standard propositional attitude semantics (based on the dynamic implementation due to Heim 1992). Imperatives, infinitives and subjunctives (the last of these not exemplified in this section) produce refining updates. With a root imperative, the refining update targets the addressee's commitment slate and produces a directive meaning; with an embedded infinitive, it leads to a comparative modal semantics and a *de se* interpretation of the subject.

The structure of the system suggests analyses for several other clause types. I have proposed that subjunctives (as well as infinitives with an overt subject) denote properties of times, but the theory has not yet been explicitly extended to them. Still, we can see that root subjunctives must have directive or evaluative meaning, while embedded ones are tied to contexts with a comparative semantics. In English, we do not have root clauses which directly target the partition component of a commitment slate, but if Coppock and Wechsler's (submitted) analysis is correct, ego-marked clauses play this role. We have also not seen a clause type in English which directly targets an ordering component of the mutual commitments. A root clause denoting a set of uncentered worlds would play this role; perhaps a tensed or third person imperative can be analyzed in this way (Mastop 2011; Zanuttini et al. 2012; Portner 2013).

The most important set of issues left open by the hypotheses laid out here concerns interrogative subjunctives and subjunctives not triggered by comparison (such as reportative subjunctives and polarity subjunctives). I have speculated that these might have a different interpretation from the subjunctives which are within the purview of the comparison-based theory, an interpration more similar to ego-marked clauses. Indeed, it does seem reasonable to relate reportative subjunctives to ego-marking, in that both of them relate to some individual's commitment slate. However, we cannot leap to postulating a second subjunctive which denotes a centered partition, for two reasons: First, we do not yet know how to understand the function of a time-centered partition, though this is a facet of the general need to understand the temporal semantics of verbal mood better. And second, we do not yet have evidence for such subjunctives surfacing as root clauses. We would either need to find root clauses which have the appropriate meanings, or give an explanation of their absence within the theory of sentence mood.

Acknowledgements

This research was supported by NSF award BCS-1053038 "The Semantics of Gradable Modal Expressions" to Graham Katz, Elena Herburger, and Paul Portner. I have received

very helpful feedback on this material at the workshops "Imperatives: worlds and beyond" in Hamburg and "New Ideas in Semantics and Modeling" in Paris, as well as at a presentation at MIT. I also thank Aynat Rubinstein, Raffaella Zanuttini, and Steve Wechsler for discussing some of the ideas developed here.

References

Abusch, Dorit. 1988. Sequence of tense, intensionality, and scope. In *The Proceedings of WCCFL 7*, 1–14. Stanford: CSLI.

Abusch, Dorit. 1997. Sequence of tense and temporal de re. *Linguistics and Philosophy* 20:1–50.

Abusch, Dorit. 2004. On the temporal composition of infinitives. In *The syntax of time*, ed. J. Gueron and J. Lecarme, 29–53. Cambridge, MA: MIT Press.

Aloni, Maria, Alaistair Butler, and Paul Dekker, ed. 2007. *Questions in dynamic semantics*. Elsevier.

Aloni, Maria, and Robert van Rooy. 2002. The dynamics of questions and focus. In *Proceedings of Semantics and Linguistic Theory 12*, ed. Brendan Jackson, 20–39. Ithaca, NY: CLC Publications.

Anand, Pranav. 2006. De de se. Doctoral Dissertation, MIT.

Avrutin, Sergey, and Maria Babyonyshev. 1997. Obviation in subjunctive clauses and agr: Evidence from Russian. *Natural Language and Linguistic Theory* 15:229–262.

Bach, Kent, and Robert M. Harnish. 1979. *Linguistic communication and speech acts*. Cambridge, MA: MIT Press.

Charlow, Nathan. 2011. Practical language: Its meaning and use. Doctoral Dissertation, University of Michigan.

Chierchia, Gennaro. 1989. Anaphora and attitudes "de se". In *Semantics and contextual expressions*, ed. Renate Bartsch, Johan van Benthem, and Peter van Emde Boas, 1–31. Dordrecht: Foris.

Ciardelli, Ivano, Jeroen Groenendijk, and Floris Roelofsen. 2013. Inquisitive semantics: a new notion of meaning. *Language and Linguistics Compass* 7.

Coppock, Elizabeth, and Stephen Wechsler. 2015. The proper treatment of egophoricity in Kathmandu Newari. Paper presented Semantics and Philosophy in Europe 8, Cambridge, UK, Sept. 17, 2015.

Coppock, Elizabeth, and Stephen Wechsler. submitted. The proper treatment of egophoricity in Kathmandu Newari. In *Expressing the self: Cultural diversity and cognitive universals*, ed. Kasia M. Jaszczolt and Minyao Huang. Oxford: Oxford University Press.

Elliott, Jennifer. 2000. Realis and irrealis: forms and concepts of the grammaticalisation of reality. *Linguistic Typology* 4:55–90.

Fabricius-Hansen, Cathrine, and Kjell Johan Saebø. 2004. In a mediative mood: The semantics of the German reportative subjunctive. *Natural Language Semantics* 12:213–257.

Faller, Martina. 2002. Semantics and pragmatics of evidentials in Cuzco Quechua. Doctoral Dissertation, Stanford University.

Farkas, Donka. 1992a. On obviation. In *Lexical matters*, ed. Ivan Sag and Anna Szabolsci, 85–109. Stanford, CA: CSLI Publications.

Farkas, Donka. 1992b. On the semantics of subjunctive complements. In *Romance languages and modern linguistic theory*, ed. P. Hirschbueler and K. Koerner, 69–104. Amsterdam and Philadephia: Benjamins.

Farkas, Donka. 2003. Assertion, belief, and mood choice. Paper presented at the workshop on conditional and unconditional modality, Vienna.

Farkas, Donka, and Kim B. Bruce. 2010. On reacting to assertions and polar questions. *Journal of Semantics* 27:81–118.

Gazdar, Gerald. 1979. *Pragmatics: Implicature, presupposition, and logical form.* Academic Press.

Giannakidou, Anastasia. 1997. The landscape of polarity items. Doctoral Dissertation, Groningen.

Giannakidou, Anastasia. 2009. The dependency of the subjunctive revisited: Temporal semantics and polarity. *Lingua* 119:1883–1908.

Giannakidou, Anastasia. 2011. Nonveridicality and mood choice: subjunctive, polarity, and time. In *Tense across languages*, ed. Renate Musan and Monika Rathert. Niemeyer.

Giannakidou, Anastasia. 2015. The subjunctive as evaluation and nonveridicality. Ms., University of Chicago. For *Mood, Aspect and Modality: What is a linguistic Category?*, ed. by Blaszack, J. A. Giannakidou, D. Klimek-Jankowska, K. Mygdalski.

Giorgi, Alessandra, and Fabio Pianesi. 1997. *Tense and aspect: From semantics to morphosyntax.* Oxford: Oxford University Press.

Groenendijk, Jereon, and Floris Roelofsen. 2009. Inquisitive semantics and pragmatics. URL sites.google.com/site/inquisitivesemantics/documents/ISP-Stanford-edition.pdf, presented at the Stanford workshop on Language, Communication and Rational Agency.

Groenendijk, Jeroen, and Martin Stokhof. 1990. Dynamic Montague grammar. In *Papers from the symposium on logic and language*, ed. L. Kálman and L. Pólos, 3–48. Budapest: Adakémiai Kiadó.

Groenendijk, Jeroen, and Martin Stokhof. 1991. Dynamic predicate logic. *Linguistics and Philosophy* 14:39–100.

Groenendijk, Jeroen, Martin Stokhof, and Frank Veltman. 1997. Coreference and modality in multi-speaker discourse. In *Context dependence in the analysis of linguistic meaning*, ed. Hans Kamp and Barbara Partee, 195–216. Stuttgart: I.M.S.

Gunlogson, Christine. 2001. *True to form: Rising and falling declaratives as questions in English*. Routledge.

Hamblin, Charles L. 1971. Mathematical models of dialogue. *Theoria* 37:130–155.

Han, Chung-Hye. 1998. The structure and interpretation of imperatives: mood and force in Universal Grammar. Doctoral Dissertation, University of Pennsylvania.

Hargreaves, David. 2005. Agency and intentional action in Kathmandu Newar. *Himalayan Linguistics* 5:1–48.

Harnish, Robert M. 1994. Mood, meaning, and speech acts. In *Foundations of speech act theory: Philosophical and linguistic perspectives*, ed. Savas L.Tsohatzidis, chapter 21, 407–459. Routledge.

Haspelmath, Martin. 2001. The european linguistic area: Standard average european. In *Language typology and language universals*, ed. Martin Haspelmath, Ekkehard König, Wulf Oesterreicher, and Wolfgang Raible, 1492–1510. Berlin: de Gruyter.

Hausser, Roland. 1980. Surface compositionality and the semantics of mood. In *Speech act theory and pragmatics*, ed. J. Searle, F. Kiefer, and M. Bierwisch, 71–95. Dordrecht and Boston: Reidel.

Heim, Irene. 1992. Presupposition projection and the semantics of attitude verbs. *Journal of Semantics* 9:183–221.

Heim, Irene. 1994. Comments on Abusch's theory of tense. In *Ellipsis, tense and questions*, ed. Hans Kamp, DYANA Deliverable R2.2B.

Huntley, Martin. 1984. The semantics of English imperatives. *Linguistics and Philosophy* 7:103–134.

Katz, Graham, Paul Portner, and Aynat Rubinstein. 2012. Ordering combination for modal semantics. In *The Proceedings of SALT 22*, ed. Anca Chereches, 488–507. CLC Publications. URL http://elanguage.net/journals/salt/article/view/22.488/3532.

Katz, Jerrold Jacob, and Paul M. Postal. 1964. *An integrated theory of linguistic descriptions*. Cambridge, Mass.: MIT Press.

Kaufmann, Magdalena. 2012. *Interpreting imperatives*. Springer.

Kempchinsky, Paula. 2009. What can the subjunctive disjoint reference effect tell us about the subjunctive? *Lingua* 119:1788 – 1810. URL http://www.sciencedirect.com/science/article/B6V6H-4VP5XM2-1/2/03481c1854d527dae6d39
twists of Mood: The Distribution and Interpretation of indicative and subjunctive.

Kratzer, Angelika. 1981. The notional category of modality. In *Words, worlds, and contexts*, ed. Hans-Jurgen Eikmeyer and Hannes Rieser, 38–74. Berlin: de Gruyter.

Krifka, Manfred. 2014. Embedding illocutionary acts. In *Recursion: Complexity in cognition*, ed. Margare and Tom Roeper. Springer.

Lewis, David K. 1979. Attitudes de dicto and de se 88:513–543.

Lohnstein, Horst. 2007. On clause types and sentential force. *Linguistische Berichte* 209:63–86.

Luján, Marta. 1979. Clitic promotion and mood in Spanish verbal complements. IULC. Bloomington, Indiana.

Luján, Marta. 1980. Clitic promotion and mood in Spanish verbal complements. *Linguistics* 381–484.

Maier, Emar. 2010. Presupposing acquaintance: a unified theory of *de dicto*, *de re* and *de se* belief reports. *Linguistics and Philosophy* 32:429–474.

Mari, Alda. 2016. Assertability conditions of epistemic (and fiction) attitudes and mood variation. In *The Proceedings of SALT 26*. CLC Publications.

Mastop, Rosja. 2011. Imperatives as semantic primitives. *Linguistics and Philosophy* 34:305–340. URL http://dx.doi.org/10.1007/s10988-011-9101-x.

Mauri, Caterina, and Andrea Sansò, ed. 2012. *Language sciences,* 34.2, special issue papers selected from the workshop 'what do languages encode when they encode reality status?' at the 41st annual meeting of the societas linguistica europaea, forlì, italy, 17-20 september 2008. URL http://www.sciencedirect.com/science/article/pii/S0388000110000963.

Mulder, Walter De. 2010. Mood in French. In Thieroff and Rothstein (2010), 157–178.

Murray, Sarah E. 2014. Varieties of update. *Semantics and Pragmatics* 7:1–53.

Murray, Sarah E. 2015. Evidentials and illocutionary mood in Cheyenne. *International Journal of American Linguistics* .

Pak, Miok, Paul Portner, and Raffaella Zanuttini. 2015. Course notes for "The syntax and semantics of discourse oriented features". LSA Summer Institute, University of Chicago.

Palmer, F.R. 2001. *Mood and modality.* Cambridge: Cambridge University Press, second edition.

Park, Yangsook. 2016. Obligatory *de se* elements with a *de re* LF. Paper presented at NISM, Paris.

Pearson, Hazel. 2013. The sense of self: Topics in the semantics of *de se* expressions. Doctoral Dissertation, Harvard University.

Pendlebury, Michael. 1986. Against the power of force: Reflections on the meaning of mood. *Mind* 95:361–372. URL http://www.jstor.org/stable/2254076.

Pica, P. 1984. On the distinction between argumental and non-argumental anaphors. In *Sentential complementation*, ed. W. de Geest and Y. Putseus, 185–193. Dordrecht: Foris.

Picallo, Carme. 1984. The infl node and the null subject parameter. *Linguistic Inquiry* 15:75–101.

Picallo, Carme. 1985. Opaque domains. Doctoral Dissertation, CUNY.

Portner, Paul. 1997. The semantics of mood, complementation, and conversational force. *Natural Language Semantics* 5:167–212.

Portner, Paul. 2004. The semantics of imperatives within a theory of clause types. In *Proceedings of semantics and linguistic theory 14*, ed. Kazuha Watanabe and Robert B. Young, 235–252. Cornell University Linguistics Department: CLC Publications. URL http://semanticsarchive.net/Archive/mJlZGQ4N/.

Portner, Paul. 2007. Imperatives and modals. *Natural Language Semantics* 15:351–383.

Portner, Paul. 2013. Imperatives. In *Cambridge handbook of semantics*, ed. Maria Aloni and Robert van Rooij. Cambridge: Cambridge University Press. To appear.

Portner, Paul. to appear. Commitment to priorities. In *New work on speech acts*, ed. Daniel Fogel, Daniel Harris, and Matt Moss. Oxford: Oxford University Press.

Portner, Paul. to appear. *Mood*. Oxford: Oxford University Press.

Portner, Paul, and Aynat Rubinstein. 2013. Mood and contextual commitment. In *The proceedings of SALT 22*, ed. Anca Chereches, 461–487. CLC Publications. URL http://elanguage.net/journals/salt/article/view/22.461/3533.

Progovac, Ljiljana. 1993. The (mis) behavior of anaphora and negative polarity. *The Linguistic Review* 10:37–59.

Quer, Josep. 1998. *Mood at the interface*. The Hague: Holland Academic Graphics.

Quer, Josep. 2001. Interpreting mood. *Probus* 13:81–111.

Quer, Josep. 2009. Twists of mood: The distribution and interpretation of indicative and subjunctive. *Lingua* 119:1779–1787.

Quer, Josep. 2010. Mood in Catalan. In Thieroff and Rothstein (2010), 221–236.

Raposo, Eduardo. 1986. On the null object in European Portuguese. In *Studies in romance linguistics*, ed. O. Jaeggli and C. Silva-Corvalan, 373–390. Dordrecht: Foris.

Rett, Jessica. 2011. Exclamatives, degrees and speech acts. *Linguistics and Philosophy* 34:411–442. URL http://dx.doi.org/10.1007/s10988-011-9103-8.

Roberts, Craige. 2012. Information structure in discourse: Towards an integrated formal theory of pragmatics. *Semantics and Pragmatics* 5:1–69.

Roberts, Craige. to appear. Speech acts in discourse context. In *New work on speech acts*, ed. Daniel Fogal, Daniel Harris, and Matt Moss. Oxford: Oxford University Press.

Rubinstein, Aynat. 2012. Roots of modality. Doctoral Dissertation, University of Massachusetts, Amherst.

Rubinstein, Aynat. 2014. On necessity and comparison. *Pacific Philosophical Quarterly* 95:512–554.

Sadock, Jerrold M. 1974. *Toward a linguistic theory of speech acts*. Academic Press.

Schlenker, Philippe. 2005. The lazy Frenchman's approach to the subjunctive (speculations on reference to worlds and semantic defaults in the analysis of mood). In *Romance languages and linguistic theory 2003: Selected papers from "Going Romance"*, ed. Twan Geerts, Ivo van Ginneken, and Haike Jacobs, 269–310. John Benjamins.

Schlenker, Philippe. 2011. Indexicality and de se reports. In *Semantics: An international handbook of natural language meaning*, ed. Klaus von Heusinger, Claudia Maienborn, and Paul Portner, volume 2. Berlin: de Gruyter.

Searle, John R. 1975. A taxonomy of illocutionary acts. In *Language, mind and knowledge*, ed. Keith Gunderson, Minnesota Studies in the Philosophy of Science, Vol. VII, 344–369. Minneapolis: University of Minnesota Press.

Searle, John R., and Daniel Vanderveken. 1985. *Foundations of illocutionary logic*. Cambridge: Cambridge University Press.

Smirnova, Anastasia. 2012. The semantics of mood in Bulgarian. In *to appear in proceedings of the chicago linguistics society 48*. Chicago Linguistics Society.

Stalnaker, Robert. 1974. Pragmatic presuppositions. In *Semantics and philosophy*, ed. M. Munitz and P. Unger, 197–213. New York: New York University Press.

Stalnaker, Robert. 1978. Assertion. In *Syntax and semantics 9: Pragmatics*, ed. P. Cole, 315–332. New York: Academic Press.

Starr, William B. 2010. Conditionals, meaning, and mood. Doctoral Dissertation, Rutgers University.

Starr, William B. 2013. A preference semantics for imperatives. Ms., Cornell University.

von Stechow, Arnim. 1995. On the proper treatment of tense. In *The proceedings of salt 5*, ed. M. Simons and T. Galloway, 362–386. Ithaca: Cornell University.

von Stechow, Arnim. 2004. Binding by verbs: Tense, person and mood under attitudes. In *The syntax and semantics of the left periphery*, ed. Horst Lohnstein and Susanne Trissler, 431–488. Berlin and New York: Mouton de Gruyter.

Suñer, Margarita. 1986. On the referential properties of embedded finite clause subjects. In *Generative studies in spanish syntax*, ed. I. Bordelois et al., 183–203. Dordrecht: Foris.

Thieroff, Rolf, and Björn Rothstein, ed. 2010. *Mood in the languages of Europe*. Amsterdam and Philadelphia: John Benjamins.

van der Torre, Leon W. N., and Yao-Hua Tan. 1998. An update semantics for deontic reasoning. In *Proceedings of DEON'98*, 409–426.

Truckenbrodt, Hubert. 2006. On the semantic motivation of syntactic verb movement to C in German. *Theoretical Linguistics* 32:257–306.

Tsoulas, George. 1996. The nature of the subjunctive and the formal grammar of obviation. In *Linguistic theory and romance languages*, ed. Karen Zagona, 295–306. Amsterdam/Philadelphia: John Benjamins.

Vanderveken, Daniel. 1990. *Meaning and speech acts*, volume Volume 1: Principles of Language Use. Cambridge: Cambridge University Press.

Vanderveken, Daniel. 1991. *Meaning and speech acts*, volume Volume 2: Formal Semantics of Success and Satisfaction. Cambridge: Cambridge University Press.

Veltman, Frank. 1996. Defaults in update semantics. *Journal of Philosophical Logic* 25:221–261.

Villalta, Elisabeth. 2008. Mood and gradability: an investigation of the subjunctive mood in Spanish. *Linguistics and Philosophy* 31:467–522.

Wechsler, Stephen, and Elizabeth Coppock. 2016. Egophoricity: the case of Kathmandu Newari. Paper presented at the Workshop on Perspectival Expressions and the de se Cross-linguistically, LSA Annual Meeting, Jan. 8, 2016.

Wilson, Deirdre, and Dan Sperber. 1988. Mood and the analysis of non-declarative sentences. In *Human agency: Language, duty and value*, ed. J. Dancy, J.Moravcsik, and C. Taylor, 77–101. Stanford CA: Stanford University Press.

Zaefferer, Dietmar. 2007. Deskewing the Searlean picture: A new speech act ontology for lingusitics. In *The proceedings of bls 32*. Berkeley Linguistics Society.

Zanuttini, Raffaella, Miok Pak, and Paul Portner. 2012. A syntactic analysis of interpretive restrictions on imperative, promissive, and exhortative subjects. *Natural Language and Linguistic Theory* 30:1231–1274.

Zu, Vera. to appear. Competition and obviation from French to Newari. In *Proceedings of NELS 46*. GLSA, Univ. of Massachusetts.