

Contextual commitment and semantic composition: mood selection with desire predicates

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Abstract

The mood selection properties of desire predicates provides a rich source of evidence regarding the semantics of propositional attitude verbs. In this paper, we focus on the crosslinguistic and intralinguistic variation with ‘want’ and ‘hope’ in Romance. *Espérer* ‘hope’ selects indicative in French, in contrast to *vouloir* ‘want’, which selects subjunctive, but Spanish *esperar* ‘hope’ and *querer* ‘want’ both take subjunctive. We explain the consistency in mood selection with ‘want’ versus the variation with ‘hope’ in terms of two key ideas: (i) ‘want’ and ‘hope’ differ in whether the attitude holder is COMMITTED towards the verb’s buletic background; and (ii) mood morphemes are modal operators which take the modal backgrounds provided by the higher verb as arguments. We then build on Rubinstein’s (2012; 2014) proposal that a pair of modal backgrounds may be simplified into a single unified background when there is commitment toward them, and Mari and Portner’s (2018)’s proposal that the indicative takes a single modal background as argument, in contrast to the subjunctive which takes two modal backgrounds as argument. Our proposal is closely related to prior versions of the commitment theory of mood in French (Portner and Rubinstein 2012; Silk 2018), but it provides an explanation of the variation between French and Spanish. We investigate multiple ways in which simplification of backgrounds may take place, locating the variation between French and Spanish desire predicates either in the syntax, in the pragmatics, or in the conceptualization of attitude content. We also articulate the relation between our proposals and recent work by Anand and Hacquard (2013) and Condoravdi and Lauer (2016).

1 Introduction

The two desire verbs ‘want’ and ‘hope’ differ in their mood selection properties across languages. ‘Want’ is strongly associated with subjunctive, as seen in (1) (French examples from Portner and Rubinstein 2012; Spanish examples from Villalta 2008):

- (1) a. Pierre veut que Marie soit heureuse. (French)
 Pierre wants that Marie is.SUBJ happy
- b. Victoria quiere que Marcela venga al picnic. (Spanish)
 Victoria wants that Marcela come.SUBJ to-the picnic

The pattern with ‘want’ is robust; we see it selecting subjunctive in Italian, Catalan, Romanian, German, and Icelandic (Portner 1997, Quer 2010, Farkas 1992, Giorgi and Pianesi 1997, Thráinsson 1990).

In contrast, there is more variation with ‘hope’. If we limit our attention to the present tense, we find a number of languages where it tends to take the indicative (French), languages where there is variation (Italian, Greek, German), and languages where it tends to take the subjunctive (Spanish, Romanian). Here we illustrate the two possibilities with French and Spanish (examples from Portner and Rubinstein 2012, Villalta 2008):

- (2) a. J’espère que tu fais toujours l’effort d’écouter tes
 I hope that you make.INDIC always the-effort to listen your
 parents. (French)
 parents
- b. Espero que venga mi hermano. (Spanish)
 hope.1SG that come.SUBJ my brother

Moreover, this variation is not simply a difference between languages. There is interpersonal variation in French; while most French speakers prefer indicative, according to Anand and Hacquard (2013) there are speakers for whom subjunctive is preferred. There is also variation based on other grammatical factors. For example, Godard (2012) points out that *espérer* occurs with both moods, and highlights the fact that the subjunctive is facilitated when the clause is modal, conditional, imperative, or gerundive (example Godard 2012, p.142):¹

- (3) On peut espérer qu’il prenne la bonne decision. (French)
 one can hope that he take.SUBJ the right decision
 ‘We can hope that he makes the right decision.’

In Italian, *sperare* ‘hope’ normally selects subjunctive in the present tense, but indicative in the future. Our goal is to explain both the difference between ‘want’ and ‘hope’, and the crosslinguistic and intralinguistic variation in mood choice seen with ‘hope’. In this paper, we will limit our attention to the contrast between French and Spanish, and focus on present tense complements, since

¹As discussed by Ridruejo (1999, p.3229) and Villalta (2008, p.511-12), Spanish *esperar* takes indicative when it means ‘expect’ and the tense is future, as shown in the following (examples from Ridruejo 1999):

- (i) Espero que venga mi hermano.
 (ii) Espero que vendrá mi hermano.
 (iii) Espero que mi hermano viniera ayer.
 (iv) *Espero que mi hermano vino/ha venido.

the other contexts mentioned (embedded future, conditionals, and modals in the matrix clause) introduce significant complexities of their own.

Theories of mood selection take ‘want’ as a paradigm case of a verb which selects subjunctive, and so are designed to capture its selectional properties. As discussed by Portner and Rubinstein (2012), the central assumption of nearly all such theories is that desire predicates have a comparative semantics, stating that certain alternatives are better than others, according to the individual whose desires are being reported. This approach leads to a problem with ‘hope’. This verb also appears to have a comparative semantics; for example, (2a) compares futures in which the addressee makes the effort to ones in which she does not, entailing that the speaker prefers the former. The only obvious strategy for traditional theories to address the problem is to propose that ‘hope’ has a non-comparative semantics more similar to ‘believe’ or ‘say’. This strategy is followed by Portner (1997) and Schlenker (2005), but the non-comparative semantic analyses they propose are not motivated by an understanding of the difference in meaning between ‘want’ and ‘hope’. Hence, they cannot be said to have explained the contrast in (1)-(2).

It has been noted that ‘hope’, unlike ‘want’, implies that the attitude holder believes the complement proposition to be possible (e.g. Portner 1992, Anand and Hacquard 2013), and it is plausible that this feature of meaning is responsible for its capacity to take an indicative complement. Anand and Hacquard (2013) label ‘hope’ an “emotive doxastic” and develop a semantics which captures this feature of its meaning. They do not, however, offer a theory of mood selection, focusing instead on the ability of different predicates to occur with epistemic modals in their complement.

Our analysis will in fact capture the intuition that ‘hope’ is closer in its semantics to ‘believe’ than ‘want’ is, and at the same time motivate a non-comparative semantics for sentences containing ‘hope’. Our analysis builds on two key proposals:

1. Modal backgrounds can be distinguished in terms of whether there is COMMITMENT on the part of an experiencer towards them. Moreover, backgrounds that are committed to can be unified to give an unordered set of accessible worlds as the modal’s quantification domain, whereas non-committed backgrounds are used to order the accessible possible worlds (Rubinstein 2012, 2014).

In the domain of desire predicates, ‘hope’ and ‘want’ have been argued to differ in their commitments to modal backgrounds (Portner and Rubinstein 2012). There is commitment towards the modal backgrounds for ‘hope’, including the desires on which it is based, and so they can be unified. There is not commitment towards the desires associated with ‘want’, so these desires cannot be unified with the beliefs and are used to order the belief worlds.

2. In the semantic composition of propositional attitude verb with a mood marked clause, the embedded clause is a modal operator which takes the

backgrounds provided by the higher verb as argument. The semantics of a propositional attitude verb is a predicate of events that designates a sequence of modal backgrounds. Intuitively, the attitude verb is doing the same job that context does in a contextualist account of modal auxiliaries like Kratzer’s, while the mood does the job associated with the modal auxiliary (Portner 1997; Kratzer 2013).

As for the mood morphemes, the indicative and subjunctive mood differ in their argument structure (Mari and Portner 2018): The indicative combines with a single modal background and gives a simple necessity semantics (like ‘must’ in Rubinstein’s approach), while the subjunctive combines with two modal backgrounds and gives a comparative semantics (like ‘ought’).

Given these ideas, we expect no variation in mood selection with ‘want’. This is so because ‘want’ is always associated with two modal backgrounds, and a subjunctive clause takes two modal backgrounds as arguments. We explain the variation with ‘hope’ in terms of whether unification occurs or not. As a desire predicate, the meaning of ‘hope’ is built fundamentally from a doxastic background and a deontic background, but because there is commitment towards the deontic component, the two components can be unified into one. This operation of unification is chosen with French *espérer* (except for the minority of speakers who prefer subjunctive), but not with Spanish *esperar*. This analysis of mood variation fits into a broader approach according to which closely related languages do not differ in the semantics of attitude verbs. Instead, the variation is explained in terms of meaning shifts which affect the ways in which their fundamentally invariant meanings are composed (Mari and Portner 2018).

2 Variation and consistency in mood selection

Both Giorgi and Pianesi (1997) and Farkas (2003) developed important proposals about crosslinguistic variation in mood selection in European languages, and recently Mari and Portner (2018) have connected crosslinguistic variation to the issue of intralinguistic variation. Focusing on the fact that Italian allows both indicative and subjunctive with belief predicate like *credere* ‘believe’, Mari and Portner aim to explain both why the subjunctive is possible (in contrast to French, where ‘believe’ only takes indicative) and how the choice of mood affects meaning. Echoing Giorgi and Pianesi (1997), they propose that ‘believe’+subjunctive conveys a DISCOURSE BELIEF meaning where the beliefs provide an evidential ordering over the worlds compatible with the common ground. For example (4a) with subjunctive is used in contexts where it is at issue whether Mary is pregnant, and conveys that Gianni’s beliefs can be considered as support for an answer in the affirmative (examples from Mari and Portner 2018, (7)):

- (4) a. Gianni crede che Maria sia incinta.
Gianni believes that Mary be.3sg.SUBJ pregnant.

- ‘Gianni believes that Mary is pregnant.’
- b. Gianni crede che Maria è incinta.
Gianni believes that Mary be.3sg.IND pregnant.
‘Gianni believes that Mary is pregnant.’

In contrast, (4b) with indicative is used to make a simple statement about Gianni’s beliefs.

We build on Mari and Portner’s (2018) approach to the semantics and pragmatics of mood. Their approach is a version of the COMPARISON-BASED THEORY OF VERBAL MOOD as discussed by Portner (2018a), described as the “proto-standard theory of verbal mood” by Portner and Rubinstein (2012). The comparison-based theory formalizes the traditional intuition that predicates with evaluative or emotive meaning will select subjunctive; within formal theories of modal meaning, evaluation and emotive semantics is typically modeled with some sort of ordering over possible worlds, such as an ordering source or similarity relation. For instance, Giorgi and Pianesi’s (1997) early theory proposed that subjunctive is associated with a non-null ordering source in French; see Portner’s discussion for a comprehensive overview (Portner, 2018a).

For the comparison-based theory, desiderative and directive predicates like ‘want’ and ‘order’ are paradigm subjunctive selectors. Following Heim (1992), Villalta (2008), Anand and Hacquard (2013), and Mari and Portner (2018), we model their comparative meanings with a similarity based semantics ultimately inspired by Stalnaker (1984). Portner (2018a) formalizes Heim’s semantics within a situation-based framework as follows:

- (5) a. $\llbracket \textit{want} \rrbracket = [\lambda p \lambda a \lambda s . a \text{ is the thinking participant in } s \text{ and for every } w \in R_{dox}(s): Sim_w(p) <_s Sim_w(\neg p)]$
- b. In words: a is the thinking participant of s and for every belief world w for a in s , every world maximally similar to w where p is true is more desirable to a in s than every world maximally similar to w where p is false.

Note that R_{dox} and $<$ take s as their sole argument. Thus, this version of the *SIM* semantics adopts Hacquard’s (2006, 2010) event relativity hypothesis, according to which modal backgrounds are associated with the event (or situation) argument of modals.

In the remainder of this section, we will first present a variation on Mari and Portner’s analysis of the subjunctive, and then review their explanation of mood variation with ‘believe’ in Italian, as well as the contrast with French. This will set the stage for our analysis of the indicative with ‘hope’ in French, and the contrast with Spanish where it takes subjunctive.

2.1 Situation-based *SIM* semantics for the subjunctive

Semantic theories of verbal mood traditionally begin by identifying properties of propositional attitude predicates that are correlated with the choice of mood in

their complement, and then state a principle which ensures that predicates cooccur with complements of the required mood. For some theories, the mechanism for connecting the predicate with its complement's mood is selection (which may be seen as s-selection or c-selection); Giannakidou's veridicality theory is of this type (Giannakidou, 1997, 1999, 2011, 2013). For others, the connection is enforced by a presupposition of the mood-marked complement; Portner (1997) and Schlenker (2005) give presuppositional analyses. Villalta (2008) argues for a semantic explanation of the selection relation between attitude verb and mood in its complement based on two ideas: that subjunctive selecting predicates are focus sensitive, and that the subjunctive introduces focus alternatives. While Villalta attempts the deepest explanation among these approaches, her analysis fails because not all subjunctive selectors are, in fact, focus sensitive, as pointed out by Portner (2011) and Harner (2016).

In line with Portner (1997) and Kratzer (2013), Mari and Portner (2018) present a comparison based theory which explains the connection between subjunctive and comparative meaning by reversing the function-argument relation between attitude verb and mood-marked clause. They treat a complement clause as a function from modal parameters (and suitable other arguments) to propositions, and analyze propositional attitude predicates as referring to the modal parameters which serve as arguments to the complement clause. This analysis allows an explanation of the connection between comparative modal meaning and the subjunctive based on the semantic types of the indicative and subjunctive.

- (6) Mood
 - a. Indicative CP: takes one modal parameter as argument
 - b. Subjunctive CP: takes two modal parameters as arguments
- (7) Attitude predicates
 - a. Non-comparative predicates: refer to a single modal parameter
 - b. Comparative predicates: refer to a pair of modal parameters

We can illustrate their analysis as follows:²

1. 'Believe'+indicative

- $\llbracket \textit{believe} \rrbracket = DOX$
- $\llbracket CP_{ind} \rrbracket = \lambda T[...]$
- $\llbracket \textit{believe}+CP_{ind} \rrbracket = \llbracket CP_{ind} \rrbracket (DOX)$

2. 'want'+subjunctive

- $\llbracket \textit{want} \rrbracket = \langle Bul, DOX \rangle$
- $\llbracket CP_{subj} \rrbracket = \lambda O\lambda T[...]$

²Our notation convention will be to use all caps to designate the modal base and ordinary capitalization to designate the ordering source (e.g., *DOX* and *Bul* below).

$$\bullet \llbracket \textit{want} + \text{CP}_{\textit{subj}} \rrbracket = \llbracket \text{CP}_{\textit{subj}} \rrbracket (\textit{Bul})(\textit{DOX})$$

We will discuss further the precise denotations of indicative and subjunctive clauses in Section 2.2

Because the indicative takes a single modal background as argument, it can combine with ‘believe’, which refers to one, *DOX*. Because the subjunctive takes two modal backgrounds as arguments, it can combine with ‘want’, which refers to $\langle \textit{Bul}, \textit{DOX} \rangle$. ‘Want’ cannot occur with the indicative, because of a type mismatch; the second modal background would not be used. Similarly, ‘believe’ is predicted not to occur with the subjunctive, because the subjunctive needs a second modal background argument which ‘believe’ does not provide. These predictions are correct for many languages, such as French and Spanish.

In order to capture the use of subjunctive with ‘believe’ in Italian, Mari and Portner (2018) propose that in Italian (but not French) the common ground can saturate the second modal argument of the subjunctive when this argument is not provided by the verb. This means that the overall semantics for ‘believe’+subjunctive is composed as in (8):

$$(8) \llbracket \text{CP}_{\textit{subj}} \rrbracket (\textit{DOX})(\textit{CG})$$

They argue that such a derivation correctly captures the discourse belief meaning of examples like (4a).³

2.2 The situation-based *SIM* semantics for indicative and subjunctive

Next we give an explicit semantics for the indicative and subjunctive which captures the connection between the evaluative/expressive meaning of subjunctive selectors and their semantics which provides a pair of modal backgrounds. Building on much of the literature on desire predicates and other evaluatives (Farkas 2003; Villalta 2008; Anand and Hacquard 2013; Mari and Portner 2018), we adopt a *SIM* semantics, but we also wish to integrate the analysis into a broadly Davidsonian framework so that it will be compatible with Hacquard’s event relativity hypothesis (following Portner and Rubinstein 2012; Portner 2018a). In the remainder of this section, we will present the key features of a system which meets these goals.

Propositional attitude verbs, like other verbs, denote predicates of situations (or, if one prefers, events):

$$(9) \quad \text{a. } \llbracket \textit{believe} \rrbracket = \lambda s[\textit{believing}(s)] \\ \quad \text{b. } \llbracket \textit{want} \rrbracket = \lambda s[\textit{wanting}(s)]$$

Event relativity states that believing situations and wanting situations have different contents:

³Giorgi and Pianesi (1997) also propose that subjunctive marking with belief predicates in Italian (as well as Icelandic and German) reflects an underlying semantics in which the subject’s doxastic alternatives and the common ground are treated as two separate modal backgrounds, in contrast to French (and Romanian) belief predicates, which use a single, doxastic background and hence take the indicative (p. 215).

- (10) a. If s is a believing situation, $\text{content}(s) = DOX(s)$
 b. If s is a wanting situation, $\text{content}(s) = \langle Bul(s), DOX^*(s) \rangle$

The background DOX^* from von Stechow (1999) is the background which yields a superset of the beliefs worlds relevant to ‘want’ (i.e. $\bigcap DOX(s) \subset \bigcap DOX^*(s)$). It disregards beliefs of the attitude holder about his future actions, following Heim’s (1992) discussion. We will disregard the difference between DOX and DOX^* in what follows. (A notational point: for semanticists who are used to the tradition of writing a pair of backgrounds with the modal base first, following Kratzer 1981, 1991, 2012, the formulation in (10b) may seem unintuitive. Our reason for keeping the background Bul that provides the ordering first is to maintain compatibility with Mari and Portner’s (2018) analysis of mood variation with ‘believe’ in Italian — though, in fact, we think that this formulation is more natural, in that ‘want’ is basically about desires, with beliefs providing a background for evaluating desires. Later in Section 3, we will provide more theoretical content to the idea that the doxastic background is backgrounded, while the buletic one can be more at issue.)

There are two contents associated with wanting situations, a buletic one and a doxastic one. We assume that $Bul(s)$ and $DOX(s)$ are premise sets, the experiencer in s ’s desires in s and the experiencer in s ’s beliefs in s . Given a premise set P , $\bigcap P$ is the set of worlds compatible with every premise in P , and $<_P$ is the pre-order which ranks worlds according to how well they satisfy the premises in P .

The subject argument of ‘believe’ or ‘want’ is associated with the situation argument of the verb via its thematic role using predicate conjunction:⁴

- (11) $\llbracket Exp \rrbracket = \lambda x \lambda s [\text{Experiencer}(x, s)]$
 (12) For any α and β of type $\langle s, t \rangle$: $[\alpha \beta]$ is of type $\langle s, t \rangle$ and $\llbracket [\alpha \beta] \rrbracket = \lambda s [\llbracket \alpha \rrbracket (s) \wedge \llbracket \beta \rrbracket (s)]$

In order for predicate conjunction to apply, the subject argument needs to be associated with the experiencer thematic role before it combines with the VP denotation. So while this argument is severed from the verb as argued by Kratzer (1996), the thematic role plays a different role in the syntax of the clause and there is no need to assume a special composition rule such as Event Identification.

Verbal moods can be thought of as thematic roles for clausal arguments. We begin with the indicative:

- (13) $\llbracket Ind \rrbracket = \lambda p \lambda s [\bigcap \text{content}(s) \subseteq p]$

⁴Because α and β might denote partial functions from situations to truth values, a more complete definition would be the following:

- (i) For any α and β of type $\langle s, t \rangle$:
- (a) $[\alpha \beta]$ is of type $\langle s, t \rangle$
 - (b) $\llbracket [\alpha \beta] \rrbracket$ is defined for any s such that $\llbracket \alpha \rrbracket (s)$ and $\llbracket \beta \rrbracket (s)$ are both defined
 - (c) When defined, $\llbracket [\alpha \beta] \rrbracket = \lambda s [\llbracket \alpha \rrbracket (s) \wedge \llbracket \beta \rrbracket (s)]$

When the matrix verb is ‘believe’, $content(s)$ will simply be $DOX(s)$.

These assumptions allow us to derive an appropriate denotation for a belief sentence with indicative (ignoring tense and aspect) as follows, where H is the proposition that Marie is happy:

- (14) Jean croit que Marie est heureuse. (French)
 Jean believes that Marie is.IND happy
- a. $\llbracket Exp[Jean] [croit Ind[que Marie est heureuse]] \rrbracket =$
 - b. $\lambda s[Experienter(j, s) \wedge believing(s) \wedge \bigcap content(s) \subseteq H] =$
 - c. $\lambda s[Experienter(j, s) \wedge \bigcap DOX(s) \subseteq H]$

Next we incorporate the subjunctive. The subjunctive instantiates a situation-based version of Heim’s *SIM* semantics. The definition uses a function *CPR* discussed by Portner (2018b) and Mari and Portner (2018). *CPR* creates a set of *SIM*-pairs, pairs of worlds which are as similar as possible given that they differ in the truth of p :⁵

- (15) $\llbracket CPR \rrbracket = \lambda p \lambda B[\{(SIM(p)(w), SIM(\neg p)(w)) : w \in B\}]$

The background B over which *CPR* creates *SIM*-pairs is, intuitively, the modal base of the *SIM* semantics.

Note that an ordering relation $<_P$ is simply a set of pairs of worlds. Thus, if we say that a set of *SIM*-pairs $CPR(p)(B)$ is a subset of $<_P$, this is equivalent to saying that for every *SIM*-pair $\langle w, v \rangle$, the following holds: $w <_P v$. Hence, we can restate Heim’s *SIM* semantics based on *CPR*. We propose that this is precisely what the subjunctive does within a situation-based framework, as we show next.

The subjunctive clause *Subj*(p) takes a situation argument s . It treats the second component of the content of s , $content_2(s)$, as the modal base. That is, $content_2(s)$ saturates B in (15). Then it evaluates the *SIM*-pairs according to the ordering induced by the first component of the content, $content_1(s)$:

- (16) $\llbracket Subj \rrbracket = \lambda p \lambda s[CPR(p)(\bigcap content_2(s)) \subseteq_{<_{content_1(s)}}]$

We exemplify the treatment of subjunctives in (17):

- (17) Jean veut que Marie soit heureuse. (French; (1a))
 Jean wants that Marie be.SUBJ happy
- a. $\llbracket Exp[Jean] [veut Subj[que Marie soit heureuse]] \rrbracket =$
 - b. $\lambda s[Experienter(j, s) \wedge wanting(s) \wedge \{(SIM(H)(w), SIM(\neg H)(w)) : w \in content_2(s)\} \subseteq_{<_{content_1(s)}}] =$
 - c. $\lambda s[Experienter(j, s) \wedge wanting(s) \wedge \{(SIM(H)(w), SIM(\neg H)(w)) : w \in \bigcap DOX(s)\} \subseteq_{<_{Bul(s)}}] =$
 - d. $\lambda s[Experienter(j, s) \wedge wanting(s) \wedge \forall w \in \bigcap DOX(s)[SIM(H)(w) <_{Bul(s)} SIM(\neg H)(w)]]$

⁵Following Mari and Portner (2018), we assume for simplicity that $SIM(p)(w)$ is always a single world, not a set of worlds as Heim assumes.

This derivation results in a standard version of the Heimian semantics for ‘want’. It is true if, for each one of Jean’s belief worlds w , if Marie is happy in w , he prefers it to the world most similar to w in which Marie is not happy; and if Marie is not happy in w , he prefers the world most similar to w in which Marie is happy to it.⁶

Our situation-based analysis allows us to retain Mari and Portner’s explanations for why ‘want’ does not allow indicative. $\llbracket Ind \rrbracket$ uses $content(s)$ in a way that will not make sense if s is a wanting situation.

- (18) *Jean veut que Marie est heureuse. (French)
 Jean wants that Marie is.IND happy
- a. $\llbracket Exp[Jean] [veut Ind[que Marie est heureuse]] \rrbracket =$
 b. $\lambda s[Experiencer(j, s) \wedge wanting(s) \wedge \bigcap content(s) \subseteq H] =$
 c. $\lambda s[Experiencer(j, s) \wedge wanting(s) \wedge \bigcap \langle Bul, DOX \rangle(s) \subseteq H]$

This derivation leads to $\bigcap \langle Bul(s), DOX(s) \rangle$, which will not result in a proper semantics for ‘want’.⁷

The analysis also allows an explanation for why ‘believe’ does not allow subjunctive in French: The denotation for the subjunctive given in (16) refers to two contents, but if s is a belief situation, its content is a single background.

- (19) *Jean croit que Marie soit heureuse. (French)
 Jean believes that Marie be.SUBJ happy
- a. $\llbracket Exp[Jean] [croit Subj[que Marie soit heureuse]] \rrbracket =$
 b. $\lambda s[Experiencer(j, s) \wedge believing(s) \wedge \{ \langle SIM(H)(w), SIM(\neg H)(w) \rangle : w \in content_2(s) \} \subseteq_{content_1(s)}]$

This derivation fails because $content(s) = DOX$, and so even if we assume that $content_1(s) = content(s)$ when there is a single content, there is no $content_2(s)$. However, if Mari and Portner (2018) are correct, Italian allows the common ground to serve as a second content in cases like (19). We can incorporate their reasoning into our situation based framework by stating that Italian (but not French) has the following coercion principle:

⁶As discussed by von Stechow (1999) and Rubinstein (2012, 2017), this approach to ‘want’ is equivalent to Kratzer’s *Human Necessity* under certain assumptions. We prefer to use the *SIM* semantics for two reasons. It is closer to other relevant works like Villalta (2008) and Anand and Hacquard (2013), and we feel it may be more insightful when we apply this framework to unembedded subjunctives. For completeness, we give two versions of a necessity semantics for the subjunctive which would fit into the overall approach of this paper:

- (i) $\llbracket Subj \rrbracket = \lambda p \lambda s [Best(content_1(s), content_2(s)) \subseteq p]$
 (ii) $\llbracket Subj \rrbracket = \lambda p \lambda s [p \text{ is a human necessity in } s \text{ with respect to } content_1(s) \text{ and } content_2(s)]$

⁷Given the standard definition of an ordered pair $\langle a, b \rangle$ as $\{\{a\}, \{a, b\}\}$, $\bigcap \langle Bul(s), DOX(s) \rangle = \{Bul(s)\}$, which is a set containing a premise set, not a set of worlds as required for the sentence not to be trivially false. Of course, we don’t want to make too much of these technical points. The fundamental claim is that the indicative needs one background as argument, not two.

- (20) Common ground as default background (Italian): For any situation s , if $content(s)$ is a single modal background:
- a. $content_1(s) = content(s)$, and
 - b. $content_2(s) = CG$

This leads to the following denotation for the Italian counterpart of (19):

- (21) Gianni crede che Maria sia felice. (Italian)
Gianni believes that Marie be.SUBJ happy
- a. $\llbracket Exp[Jean] [crede Subj[che Marie sia felice]] \rrbracket =$
 - b. $\lambda s [Experiencer(j, s) \wedge believing(s) \wedge \langle SIM(H)(w), SIM(\neg H)(w) \rangle : w \in content_2(s)] \subseteq_{<content_1(s)} =$
 - c. $\lambda s [Experiencer(j, s) \wedge believing(s) \wedge \langle SIM(H)(w), SIM(\neg H)(w) \rangle : w \in CG] \subseteq_{<DOX(s)} =$

Setting aside the situation based framework and its adherence to the event relativity hypothesis, this derivation yields the meaning that Mari and Portner (2018) argue captures the discourse belief meaning of ‘believe’+subjunctive. Interestingly, principle (20) predicts that subjunctive is always possible in Italian, with a discourse-oriented meaning derived from the intrusion of CG into the semantics.

This explanation of variation with ‘believe’ reduces the difference between languages to a single coercion principle outside of the core compositional system. Crucially, the meanings for the attitude verbs are the same in French and Italian, and the meanings of the moods differ only in the constrained way described by (20).⁸ Our analysis of the variation in mood selection with ‘hope’ will be similar. We propose that the verbs have the same meanings in Spanish as in French, and explain the fact that Spanish uses subjunctive while French requires indicative in terms of a single operation which simplifies the meaning of ‘hope’ (in French but not Spanish) when appropriate conditions are met.

3 Mood selection in desire predicates in French: ‘want’ vs. ‘hope’

Desire predicates are typically treated as a semantically homogenous class. Following Heim (1992), ‘want’ is analyzed as a comparative attitude that is sensitive to two modal backgrounds: a doxastic background shared with ‘believe’, and a desiderative background, which encodes the content of an experiencer’s preferences. Other desire predicates, including ‘wish’ and ‘be glad’ are similarly assumed to be comparative, invoking a preference ranking of the experiencer’s

⁸In Mari and Portner’s original analysis, there is no difference in the semantics of either the verbs or the moods. The difference resides in a coercion principle which applies at the point when the sentence is incorporated into the common ground, available in Italian but not French. It is more difficult to attribute the difference to such a discourse-level principle within the situation based framework.

belief worlds.⁹ Such an analysis leads to the expectation that, all else being equal, desire predicates would pattern together in grammatical constructions that depend on a comparative semantics.

If the comparison-based theory of mood is correct and if all desire predicates are comparative in Heim’s sense, they should all combine with subjunctive complements. Languages like Italian and Spanish support these assumptions (Giorgi and Pianesi, 1997, 213). Alongside *querer* ‘want’, Spanish desire predicates of various sorts take subjunctive complements: *esperar* when it means ‘hope’, *desear* ‘desire’, *alegrar* ‘be glad’ (Villalta 2008, 519). But whereas ‘want’ strongly selects the subjunctive across languages, ‘hope’ is subject to variation. French contrasts with Spanish (and Italian; Portner 1997) in requiring indicative with ‘hope’ for most speakers. We first saw this contrast between French and Spanish in (2) above; (22) is a minimal pair.¹⁰

- (22) a. J’espère que tu fais toujours l’effort d’écouter tes
 I hope that you make.INDIC always the-effort to listen your
 parents. (French)
 parents
- b. Espero que siempre les hagas caso a tus padres.
 I hope that always DAT.PL pay.attention.SUBJ to your parents
 (Spanish)

‘I hope you always make the effort to listen to your parents.’

Understanding the source of the contrast between ‘want’ and ‘hope’ is a longstanding puzzle for theories of verbal mood. Portner (1997) and Schlenker (2005) propose that ‘hope’ should be given a non-comparative semantics when it takes indicative, similarly to ‘believe’. They do not give a principled reason for the difference between ‘want’ and ‘hope’, however, and therefore fail to account for the crosslinguistic tendency of desire predicates to take subjunctive. If desiderative meanings can in principle be given a non-comparative semantics, it is unclear why ‘hope’ in particular shows variation in allowing the indicative. We turn now to recent work on modal necessity that offers a way to ground the claim that ‘hope’ but not ‘want’ can have a non-comparative semantics.

3.1 Necessity and commitment

Among modal auxiliaries that express necessity, the difference between *ought* and *must* has proven difficult to pin down. *Ought* and *should* are sometimes called “weak” necessity modals, in contrast to the “strong” *must* and *have to*. Various hypotheses have been entertained about the source of the difference between these modals, ranging from quantificational force (Horn, 1972; Hegarty, 2016),

⁹Or a superset thereof, in counterfactual desire statements with ‘wish’ and in certain uses of ‘want’ as well (see Heim 1992; von Stechow 1999; Villalta 2006, 2008; Rubinstein 2017; Phillips-Brown 2017).

¹⁰We thank Elena Herburger for the Spanish judgment.

measures of probability and utility (Goble, 1996; Finlay, 2009, 2010; Lassiter, 2011, 2017), and the importance of the modal’s backgrounds (Bybee et al., 1994; Portner, 2009; von Stechow and Iatridou, 2008), to name a few central themes. Responding to these proposals, Rubinstein (2012, 2014) has argued that strength of necessity has a discursive basis, reflecting a notion of COMMITMENT TO PRIORITIES. She proposed that weak necessity modals are weak because they rely in part on assumptions that have weak standing in the discourse, in the sense of being negotiable among relevant individuals. In a speech event, these individuals are the conversational participants. When a manager says that taxes *should* be paid, as in (23), she comes across as being not fully committed to paying taxes (example from Rubinstein 2014, 538).

- (23) [Preparing a company’s tax report.]
We should report all of our revenue.

Commitment and negotiability are defined in (24) following Rubinstein (2014).

- (24) a. An individual a is COMMITTED to a modal background h in situation s iff it is assumed that a is disposed/prepared in s to argue for $h(s)$ in a conversationally appropriate way (e.g. by arguing that it is rational/proper/sensible/wise), in any relevant conversation c .
b. A premise set $g(s)$ is NEGOTIABLE iff not all individuals who bear thematic roles in s are committed to g in s .

Commitment is a status attributed to modal backgrounds based on what particular individuals think is correct, rational, or proper in particular situations (or events). This is the notion that Portner and Rubinstein (2012) argue is relevant for mood selection.¹¹ Negotiability gauges shared or collective commitment, which if Rubinstein is correct, play an important role in determining the distribution of weak and strong necessity modals.

Commitment (and negotiability) can be determined for both beliefs and priorities. An attitude holder is committed to the doxastic modal background that represents his beliefs in a given believing situation. Similarly, the common ground is based on commitment. On a standard Stalnakerian conception, the common ground is made up of the collective commitments of the participants in a conversation, which makes it not negotiable in our terms.¹² Turning to priorities, paying taxes may not enjoy commitment (and hence belong to a negotiable premise set) at some point in a conversation in case some conversational participant is not prepared to follow all clauses of the law at that point.

Rubinstein proposes that discursive considerations relating to commitment are encoded in the grammar of necessity, and have semantic and not just pragmatic manifestations. Weak necessities on her analysis are partly sensitive to

¹¹(24a) is essentially the definition of commitment given by Portner and Rubinstein (2012), with one change: commitment turns on *assumptions* about an individual’s thoughts in s , not on their actual thoughts in s .

¹²In certain models of discourse, the common ground is explicitly derived from records that keep track of the participants’ individual public commitments (Gunlogson 2001, 2008; Farkas and Bruce 2010, among others).

assumptions that are negotiable in a conversation, while strong necessities are based only on “solid”, non-negotiable material. The use of *should* in an example like (23), for instance, reflects lack of commitment to relevant tax laws at the collective discourse level.

Observing an affinity between ‘ought’ and comparative evaluative expressions like ‘preferable’ and ‘worthwhile’, Rubinstein (2014) argues that there is also a formal distinction between necessities that are comparative (the weak necessities) and ones that are not (the strong ones). This distinction is reflected, she claims, in the structure of modal quantification domains, such that only non-committed priorities rank and compare worlds (how this works is discussed in detail below). Informally, not every ideal or norm is automatically incorporated into an ordering source.

Adapting the idea of commitment to mood, Portner and Rubinstein (2012) have proposed that mood choice reflects the weak/strong distinction in commitment in the domain of propositional attitudes. On their proposal, hoping is a “strong” attitude in that it is based on desires that the experiencer is committed to and is prepared to defend, whereas wanting carries no implication of commitment and can be based on preferences that are more “glandular” (Bolinger, 1974). This contrast between the predicates is brought out in scenarios like (25) (example from Portner and Rubinstein 2012, p. 470). The patient knows that smoking a cigarette is not defensible in light of the doctor’s directive, but she nevertheless desires one in the glandular sense.

- (25) [You are at your doctor’s office for an annual checkup. He has just told you what bad shape your lungs are in. If you continue to smoke, you will soon die.]
 Oh gosh, Doctor, with all this stress I really want/??hope to have a cigarette as soon as I leave!

‘Want’ and ‘hope’ are sensitive to commitment in the same way in both French and Spanish, despite the variation in mood marking. To see the mood, we need to look at sentences with a matrix subject that is distinct from the embedded subject, as in (26) (example from Portner and Rubinstein 2012, p. 471) and its Spanish translation in (27).¹³

- (26) [The king is being bothered by an uppity bishop and makes his annoyance known to some knights. These knights go and kill the bishop, and when the king hears about it, he is angry because it makes him look bad with the church. The knights respond with one of the following.]
- a. Mais vous vouliez qu’il soit tué! (French)
 but you wanted that he be.SUBJ killed
 ‘But you wanted him to be killed!’
 - b. ??Mais vous espériez qu’il serait/est tué!
 but you hoped that he be.COND.INDIC/is.INDIC killed
 ‘??But you hoped for him to be killed!’

¹³We thank Paula Menéndez-Benito for the Spanish data.

- (27) ¡Pero tú querías/??esperabas que lo matáramos! (Spanish)
 but you wanted.IMPF/hoped.IMPF that him kill.SUBJ
 ‘But you wanted/??hoped that we kill him!’

In this context, the king’s gut desire to get rid of an opponent is not a preference he is committed to, since he thinks it is unwise. ‘Want’ is felicitous in both languages to report on this desire. ‘Hope’ is infelicitous in both, despite the subjunctive marking in Spanish (27). It is not the case that subjunctive “trumps” the attitude expressed by the verb.

Being committed to a priority entails that the priority has a chance of materializing, both circumstantially, given relevant facts, and preferentially, given other priorities. In other words, one cannot be committed to inconsistent priorities, and one cannot be committed to priorities that are circumstantially unrealistic. One can only have a “weak” desire, expressible with ‘want’, for inconsistent (28) and unrealistic (29) priorities (examples from Portner and Rubinstein 2012, 472; see also Portner 1997, Giorgi and Pianesi 1997, 213).¹⁴

- (28) a. I want to marry Alice and I want to marry Sue.
 b. ??I hope to marry Alice and I hope to marry Sue.
- (29) I want/??hope to build a perpetual motion machine.

Realism and consistency are grammatically relevant for attitude semantics not only in the context of mood. Based on observations by Hare (1971, 1986) and Levinson (2003), Condoravdi and Lauer argue in a recent line of work that priorities are distinguished in the grammar based on whether they are action-guiding or not (Condoravdi and Lauer, 2011, 2012, 2016; Lauer, 2013). Those that shine through in anankastic interpretations of conditionals (30). These are conditionals in which the prejacent of the modal in the consequent expresses a necessary condition for achieving the goal stated in the clause embedded under ‘want’ in the antecedent. Priorities that one has “as a matter of psychological fact” (Hare 1986) do not give rise to an anankastic interpretation (31). Evidently, ‘want’ can accommodate both types of priorities.

- (30) If you want to eat chocolate, you should first finish your dinner.
- (31) If you want to eat chocolate, you should try thinking about something else. (Condoravdi and Lauer, 2016, (5))

Condoravdi and Lauer (2016) call the preferences that give rise to anankastic interpretations EFFECTIVE PREFERENCES (EPs) and characterize them as action-relevant preferences, or preferences the agent takes into account when choosing between available actions (p. 25). They do not provide a full characterization of these preferences but assume that they must be consistent and realistic (p. 33), just like the committed priorities we have discussed. Similarly,

¹⁴As noted by Portner and Rubinstein (2012), examples like (25) show that ‘hope’ may be impossible even though a priority can be realistically materialized, so realism is a necessary but not sufficient condition for commitment.

Grano (2017) argues that *intend* in English is relativized lexically to an experiencer’s effective preferences. He characterizes intention reports as describing “a kind of internal commitment or resolve on the part of the attitude holder to carry out some action” (p. 588).

Priorities that are committed to in our sense have the signature of effective preferences in Condoravdi and Lauer’s sense, yet we believe that commitment provides a more accurate characterization of “strong” mood.¹⁵ Focusing on ‘hope’, it is clearly the case that one can be contextually committed to the desirability of outcomes of random processes, like a coin toss (32a), which one has no control over and cannot take into account when choosing actions.¹⁶ Similarly, one can be committed to the ideal of peace in a faraway country without it guiding their actions (32b).

- (32) a. I hope the coin will land heads.
b. Nothing I do can help, but I hope that all ethnic clashes in Africa will end soon.

These examples bring to light a more general question, concerning the connection between commitments and actions. We will postpone this discussion until Section 5, in which we contextualize our analysis with respect to relevant work in the literature.

If our proposal is on the right track, differences in mood marking between ‘want’ and ‘hope’ are not idiosyncratic lexical facts. Rather, they reflect a split within the class of desire predicates between those that require commitment of an experiencer to her desires and those that do not (Portner and Rubinstein, 2012). In what follows, we take this idea a step further. Following Rubinstein (2012, 2014), we argue that while attitudes without commitment are required to have a comparative semantics, those with commitment can have a non-comparative semantics.

Typically, the same formal tools are used in the analysis of weak and strong necessities. Both ‘ought’ and ‘must’ are assumed to rely on a modal base to retrieve a set of accessible worlds, and on one or more ordering sources to rank these worlds and characterize those that are “best” (von Fintel and Iatridou, 2008; Hegarty, 2016).¹⁷ Rubinstein (2012, 99-100) argues that negotiability offers a different perspective on the landscape of modal backgrounds, suggesting

¹⁵We will base our argument for commitment mainly on mood, but assuming that the same principles underly strength in both mood and modality, observations based on the interpretation of necessity modals also become relevant.

¹⁶The concepts of “choosability” (Kolodny and MacFarlane, 2010) and “actionability” (Charlow, 2013) from the literature on decision under uncertainty are relevant here.

¹⁷This is true of the proposal by von Fintel and Iatridou (2008), which utilizes two series of ordering sources (see Rubinstein 2012, 2014 for discussion). Matters are a bit different if one denies the Limit Assumption, as does Hegarty (2016). On his proposal weak and strong necessities are both sensitive to a modal base and an ordering source, but have distinct quantificational components: ‘ought’ has the semantics of Kratzer’s Weak Necessity, while ‘must’ denotes Kratzer’s Human Necessity. In contrast to the proposal we advance in this paper, both types of necessities are assumed according to Hegarty (2016) to involve world ranking and comparison.

that non-negotiable priorities are more similar to a modal base in Kratzer’s sense, not to an ordering source, because they serve to eliminate possibilities from consideration in the same way that relevant facts delimit the space of possibilities that are “live” in a particular context. She proposes that negotiable priorities, in contrast, add structure to the set of live possibilities by ordering and comparing them. This view entails that weak necessity is a comparative necessity (resonating with early work by Sloman (1970)), while strong necessity is not. Rubinstein (2014) develops this proposal further based on the semantic affinity between weak necessity modals and comparative evaluative expressions (e.g., ‘better/best’, ‘worthwhile’, ‘preferable’) across languages.

3.2 Commitment and mood selection in French

We will now formalize these ideas in a way that fits naturally with the semantics of mood presented in the previous section, and then present our analysis of the contrast between ‘hope’ and ‘want’ in French.

Commitment and unification of modal backgrounds. If we have a pair of modal backgrounds which are consistent individually and with one another, the operation which combines them into one is simple. It is just the pointwise union of the premises they provide in each situation for which they are defined. We will begin the development of our system by assuming that these conditions hold, and we use the operation *Unify* to represent it.¹⁸

- (33) **Unification of modal backgrounds (when backgrounds are consistent):** For any pair of modal backgrounds $\langle f, g \rangle$ such that $f(s) \cup g(s)$ is consistent in all situations s (for which $f(s)$ and $g(s)$ are defined):

- $\text{Unify}(\langle f, g \rangle) = \lambda s. f(s) \cup g(s)$

Later in this section, we consider how to relax the assumption of consistency.

In principle, unification could happen to any pair of backgrounds, but it is our proposal that in some languages, modal backgrounds are unified specifically when an experiencer is committed to them. We can state the commitment conditions under which unification happens with the following simplification operator *SPL*:

- (34) **Simplification of committed backgrounds:** For any sequence of modal backgrounds M and situation s with an experiencer, $\text{SPL}(M, s) =$

- $\text{Unify}(M)$, if M is a pair and the experiencer of s is committed in s to both backgrounds in M ;

¹⁸Note that *Unify* applies to a pair of backgrounds, but in principle a modal operator can involve more than two. If the experiencer is committed to three or more backgrounds and they are to all be unified, *Unify* could apply iteratively, or the definition could be generalized (see Rubinstein 2012, 198-199). At this point in the discussion, the option of unifying more than two backgrounds is not relevant, but we discuss a case later on where three backgrounds may be involved.

- M , otherwise.

(It would of course be possible to build the restriction on commitment into the initial definition of *Unify*, but we have chosen to separate the logical operation *Unify* from the commitment condition in our formalization.)

In the interpretation of a propositional attitude, the modal backgrounds that may be subject to unification are those that constitute the content of the situation described by the attitude predicate. Certain situation types entail commitment, or the lack of commitment:¹⁹

- (35) For any situation s :
- If s is a wanting situation, the experiencer of s is not committed in s to $content_1(s)$.
 - If s is a hoping situation, the experiencer of s is committed in s to both $content_1(s)$ and $content_2(s)$.

Note that (35) states that wantings never involve commitment towards their ordering background. This may seem odd, since it is certainly possible to express commitment towards the preferences reported by ‘want’:

- (36) I want to have a nice cup of tea, since a cup of tea is always the best medicine, and I’m going to make one right now.

This type of example is not in fact technically inconsistent with principle (35), since commitment is relative to a situation and the principle leaves open the possibility that the experiencer of a wanting situation is committed to the buletic background in a (simultaneous) intending situation distinct from the wanting situation. All the condition says is that commitment is not a feature of wanting per se. We will discuss this issue further, and point out a way to avoid the potentially problematical assumptions involving situations, as we consider variant analyses later in this section.

Formal model of mood selection in French. The central puzzle we aim to solve here is why French and Spanish differ in their mood selection with desire predicates. From the perspective of the comparison-based theory, the Spanish pattern of subjunctive marking with ‘hope’ is expected, but from the perspective of commitment to priorities, the French indicative marking is expected. We begin by capturing the pattern with French, and then will explain why Spanish differs in Section 4.

The French mood system is sensitive to contextual commitment, and builds unification into the meaning of the indicative. This means that the indicative will be possible not only when a predicate is lexically associated with a single background (as with ‘say’ or ‘believe’), but also when it is associated with a content where a pair of backgrounds can be unified into one. The required entry is given in (37):

¹⁹These conditions could be stated in a more formal metalanguage, e.g. $\forall s[wanting(s) \rightarrow \neg committed(x[Experiencer(x, s), content_2(s), s])]$

$$(37) \text{ French indicative: } \llbracket Ind \rrbracket = \lambda p \lambda s [\bigcap (\text{SPL}(content(s), s)(s) \subseteq p)]$$

There are three cases to consider. First, if $content(s)$ is a singleton, as with ‘believe’, then SPL is vacuous (and indicative applies). Second, if $content(s)$ is a pair and the experiencer is not committed to both backgrounds in it, SPL is also vacuous but $\bigcap (\text{SPL}(content(s), s) = \emptyset$.²⁰ In this case, the subjunctive is required. And third, if $content(s)$ is a pair and the experiencer is committed to both backgrounds in it, SPL creates a single background, and the indicative applies. Because the experiencer is committed to the backgrounds associated with ‘hope’, it exemplifies the third type of case.

To complete the model, we must incorporate a mechanism to block the use of subjunctive with ‘hope’ in French, subject to the variability noted in Section 1. We assume that the denotation for the subjunctive is normally (and prescriptively) the following one that incorporates SPL:

$$(38) \text{ French subjunctive: } \llbracket Subj \rrbracket = \lambda p \lambda s [CPR(p)(\bigcap content_2(\text{SPL}(content(s), s))) \subseteq \langle content_1(\text{SPL}(content(s), s)) \rangle]$$

The basic idea about French is that both moods try to unify the backgrounds by applying SPL. Therefore the indicative will be required if the experiencer is committed to them. If the subjunctive is chosen when the experiencer is committed, the result is predicted to be ungrammatical because $content_2$ is not defined after SPL unifies the pair of backgrounds into one. We expect subjunctive to remain possible even when commitment holds if the original denotation (16) is in the particular individual’s lexicon, as a matter of individual variation.

Variant formulations of the analysis of French. The denotations we have proposed for French indicative and subjunctive morphemes, repeated below, apply the simplification operator SPL whenever $content(s)$ is accessed:

$$(39) \text{ French indicative: } \llbracket Ind \rrbracket = \lambda p \lambda s [\bigcap (\text{SPL}(content(s), s) \subseteq p)]$$

$$(40) \text{ French subjunctive: } \llbracket Subj \rrbracket = \lambda p \lambda s [CPR(p)(\bigcap content_2(\text{SPL}(content(s), s))) \subseteq \langle content_1(\text{SPL}(content(s), s)) \rangle]$$

This situation suggests that we might separate the simplification operation from the mood morpheme. In this section, we will explore how such a separation might be achieved. Note that, because we are exploring options that will not figure in the “official” proposal, we will not make all technical details explicit. We assume that readers can infer the backgrounded technical adjustments on their own.

1. **SPL is introduced by a distinct syntactic formative.** If we had followed the details of Mari and Portner (2018), it would be easy to treat

²⁰The precise way in which the indicative fails in this case depends on how the intersection of an ordered pair is defined. If $\langle f, g \rangle$ is an abbreviation for $\{\{f\}, g\}$, the intersection is \emptyset . If we define $\bigcap \langle f, g \rangle$ as $f \cap g$, as seems intuitive, the result will be a nonsensical truth conditions stating that a set of propositions is a subset of a set of worlds.

SPL as a morpheme. In their system, propositional attitude verbs refer to a sequence of modal backgrounds, and so it would be possible to apply SPL to that sequence prior to combination with the mood morpheme; this could be done either within the matrix VP or within the embedded CP. However, in our analysis as developed so far, mood marked clauses apply to situations from which the modal backgrounds are recovered via the *content* function. This use of event relativity makes it more challenging to separate simplification from the rest of the meaning we have attributed to the mood morphemes. Nevertheless, there are several options for introducing SPL into the syntactic derivation separately from the mood morphemes.

One approach would be to treat SPL as a function from situations to situations. We illustrate with the indicative:

- (41) For any situation s with an experiencer, $\text{SPL}_{ss}(s) = s'$, where
- $\text{content}(s') = \text{Unify}(\text{content}(s))$, if the experiencer of s is committed in s to more than one element in $\text{content}(s)$;
 - $\text{content}(s') = \text{content}(s)$, otherwise.
- (42) French indicative (variant): $\llbracket \text{Ind} \rrbracket = \lambda p \lambda s [\bigcap \text{content}(s) \subseteq p]$

With these changes, we could assume that the denotation of the mood-marked clause $\llbracket \text{Ind}(S) \rrbracket$ function-composes with SPL_{ss} ,²¹ yielding the same overall result as (39). The problem with the approach of (41)-(42) is that there is no clear reason to assume that an s' of the kind referenced in (41) always exists. In particular, when there is a hoping situation s where $\text{content}(s) = \langle \text{Bul}, \text{DOX} \rangle$, can we be sure that there is also an s' where $\text{content}(s') = \text{Unify}(\langle \text{Bul}, \text{DOX} \rangle)$? Perhaps, but we will also explore another option.

As an alternative to treating SPL as a function from situation to situations, we might retain its type as a function from sequences of backgrounds to sequences of backgrounds, but remove the specification of the background from the mood morpheme:

- (43) French indicative (variant): $\llbracket \text{Ind} \rrbracket = \lambda p \lambda M [\bigcap M \subseteq p]$

Here indicative is simply a necessity modal. Now we treat as independent in the derivation both SPL and *content*. For example, we might assume a tree where each of these is introduced via its own syntactic formative, leading to the denotation (44):

- (44) $\llbracket [\text{SPL } \text{content}] [\text{Ind } S] \rrbracket = \lambda s [\bigcap \text{SPL}(\text{content}(s), s) \subseteq p]$

It is straightforward to adjust the meaning of the subjunctive to work with separated SPL and *content* as well.

²¹As: $\lambda s [\llbracket \text{Ind}(S) \rrbracket (\text{SPL}_{ss}(s))]$.

Because this variant puts the simplification operation into the syntax, it allows for a different kind of explanation of the variability or consistency in mood selection across predicates. In French, we would say that ‘hope’ occurs with SPL and that ‘want’ does not. These correlations could be seen as syntactic properties of the predicates, applicable even when the commitment condition is not met. In other words, we could suggest that ‘hope’ occurs with SPL because in general hoping situations involve commitment, and that ‘want’ does not occur with SPL because in general wanting situations do not. However, if ‘want’ sometimes occurs with a committed buletic background, as we might think is the case in examples like (36), it still occurs with the subjunctive. In our main proposal (40), this is not possible; as discussed above, we must say that there is never commitment in a wanting situation s towards the buletic background of $content(s)$.

While we judge this system which introduces simplification and *content* in the syntax to be interesting and insightful in certain respects, it opens up syntactic issues that we cannot address here. In particular, is there evidence that complement clauses contain a syntactic head for *content*? Similarly, is there evidence for a separate morpheme SPL on more or less every complement clause in French, but only on some in languages like Spanish, where simplification does not always apply? We must leave these important issues for future study.

2. **SPL is incorporated into *content*.** Another option would be to consider simplification not as a separate operation, but as part of the concept of the content of a situation. We have worked with the assumption that $content(s)$ can be “read off of” s in a straightforward way — that is, that there is just one linguistically relevant way of understanding the content of a content-bearing situation, and that the *content* function identifies it. However, it could be more reasonable to think of the content of a situation as a somewhat flexible concept, so that the precise way the content of s enters the semantic computation could differ between languages. Thus, we might have:

- (45) Content of a situation (French, variant):
- a. For any belief situation s , $content_F(s) = DOX(s)$
 - b. For any wanting situation s , $content_F(s) = \langle Bul(s), DOX(s) \rangle$
 - c. For any hoping situation s , $content_F(s) = Unify(\langle Bul(s), DOX(s) \rangle)$

The idea of this approach is that in some languages (like French), the content of a hoping situation (where the desires are committed to) is viewed as a single background, while in other languages (like Spanish), the content of hoping situation is viewed as a pair of backgrounds, like a wanting situation, despite the fact that the experiencer is committed to the buletic background.

3. **SPL is a discourse-level operation.** A final possibility for revising the semantics to allow for separation would be to revise the compositional mechanics more radically and adopt a system where modal backgrounds are shiftable parameters of interpretation (Portner 1997; Yalcin 2007, 2010, 2012; Anand and Hacquard 2013). Suppose that propositional attitude verbs have two semantic functions: they introduce an experiencer argument in the syntax, and shift the modal parameters within their scope:

- (46) Semantics of attitude verbs (variant):
- a. $\llbracket \text{believe } S \rrbracket^{M,s_0} = \lambda x \lambda s [Exp(x, s) \wedge \llbracket S \rrbracket^{\langle DOX(s), s \rangle}]$
 - b. $\llbracket \text{want } S \rrbracket^{M,s_0} = \lambda x \lambda s [Exp(x, s) \wedge \llbracket S \rrbracket^{\langle Bul(s), DOX(s), s \rangle}]$
- (47) a. French indicative (variant): $\llbracket \text{Ind} \rrbracket^{M,s} = \lambda p [\bigcap M \subseteq p]$
 b. French subjunctive (variant): $\llbracket \text{Subj} \rrbracket^{M,s} = \lambda p [CPR(p)(\bigcap M_2) \subseteq \langle M_1 \rangle]$

In a system like this, one can understand simplification as a constraint on possible modal parameters. When the parameters are M, s and the experiencer of s is committed the backgrounds in M , unification must apply:

- (48) Simplification of modal parameters (French, variant):
 For any phrase ϕ , sequence of backgrounds M and situation s ,
- $\llbracket \phi \rrbracket^{M,s} = \llbracket \phi \rrbracket^{\text{SPL}(M,s),s}$

The idea here is that (48) rules out non-single-membered sequences of committed backgrounds in French. If there is commitment, multiple backgrounds must be unified before moving along with the derivation.^{22,23} Stepping back, this third system can be seen as instantiating the intuition that commitment is fundamentally a discourse-level concept and simplification a discourse-level process (as in Rubinstein 2012, perhaps already in Frank 1996). The process is expected to affect any predicate whose backgrounds are committed. The technique of shifting modal parameters is a way of bringing discourse-level processes into the subsentential, compositional semantics.

One type of data which would be important for distinguishing among the various options for formalizing our general approach to mood has to do with the range of lexical variation in mood selection within a single language. In our “official” system, simplification happens at the level of the mood morpheme, and

²²Formally, (48) can be thought of as a coercion which must apply before any other compositional rule; for example, function application cannot apply to any node which meets the conditions for (48).

²³It is worth noting that this third approach is parallel to the way of achieving separation of SPL within the system of Mari and Portner (2018), the difference being whether the sequences of backgrounds are manipulated in the object language or the metalanguage. Rubinstein’s (2012) unification was also implemented in the metalanguage.

so if a speaker has an entry for indicative that includes SPL, indicative should be possible with every predicate where the commitment condition is satisfied. Likewise, in the variant where simplification is a discourse-level operation, it should apply regardless of the lexical material present. In contrast, if SPL is introduced in the syntax, it could be stipulated to be present with some predicates and not others. This could lead to a case where predicates of committed preference differ in whether indicative of subjunctive is used. An initial survey of predicates of committed preference in French ('intend', 'plan') suggests that they all select indicative, consistent with the idea that the application of SPL is not a matter of lexical variation.

Simplification is a meaning-preserving operation. When SPL unifies a pair of backgrounds to which the experiencer is committed, we nevertheless end up with the same meaning we would have gotten for the sentence as a whole if unification had not applied. This point is obvious if one assumes a necessity semantics for comparative predicates, since the following holds:

- (49) If $content(s)$ is a pair of modal backgrounds and the experiencer of s is committed to both:
- $\bigcap(\text{SPL}(content(s), s) = \text{Best}(content_1(s), content_2(s)))$

In this sense, we can think of French indicative as applying a meaning-preserving type shift to 'hope'. Though SPL affects the compositional process, it does not affect the truth conditions.

Within a *SIM* semantics, it is trickier to make the point that simplification is a meaning-preserving type shift. What we want to prove is the following:

- (50) If $content(s)$ is a pair of modal backgrounds and the experiencer of s is committed to both:
- $\bigcap(\text{SPL}(content(s), s) \subseteq p \Leftrightarrow \forall w \in \bigcap content_2(s)[\text{SIM}(p)(w) <_{content_1(s)} \text{SIM}(\neg p)(w)])$

This equivalence does not hold in an unrestricted fashion. However, it does hold on the assumption that none of the *SIM* pairs involves a world outside of $content_2$. This assumption is in fact reasonable in the case of 'hope', where $content_2(s) = \text{DOX}(s)$, since it amounts to the claim that the set of doxastic alternatives contains all of the worlds being compared. We propose that 'hope' requires that this condition hold:²⁴

- (51) If s is a hoping situation, where $content(s) = \langle \text{Bul}, \text{DOX} \rangle$:

²⁴The usual way of deriving a pre-order from a premise set creates a relation over the set of all worlds in the model, so for (51) to hold, we need to revise this definition. We assume that all propositions in $\text{Bul}(s)$ are subsets of $\text{DOX}(s)$, and that $\text{DOX}(s)$ defines the domain of the relation by being a member of $\text{Bul}(s)$. Then we define the order as in (i):

(i) $\leq_g = \{(w, v) \in \bigcup g \times \bigcup g : \{p \in g : v \in p\} \subseteq \{p \in g : w \in p\}\}$

(To create an order over a wider set W , we would include W in $\text{Bul}(s)$.) The assumptions mentioned here are the official content of condition (51).

- $<_{Bul(s)} \subseteq DOX(s) \times DOX(s)$

We will discuss further the value of this assumption in Section 5.1, where we discuss the relation between our analysis and the proposal of Anand and Hacquard (2013). It is also closely related to a proposal by Heim (1992, p. 197) that the *SIM* pairs compared by ‘want’ are $DOX(s) + p$ and $DOX(s) + \neg p$ worlds:

$$(52) \quad c + \alpha \text{ wants } S = \\ \{w \in c : \text{for every } w' \in DOX_\alpha(w) : \\ SIM_{w'}(DOX_\alpha(w) + \phi) <_{\alpha, w} SIM_{w'}(DOX_\alpha(w) + \neg\phi)\}$$

Introduced to account for presupposition projection facts, (52) turned out to be problematical for ‘want’, because it is possible to want what we consider impossible or certain (i.e. where $p \cap DOX_\alpha(w) = \emptyset$ or $\neg p \cap DOX_\alpha(w) = \emptyset$). However, it seems to be correct for ‘hope’, since one cannot hope for things we consider impossible or certain, as mentioned above:

- (53) a. I will always live in Paris because I want to live in Paris.
 b. *I will always live in Paris because I hope to live in Paris.
- (54) a. I will always live in Paris, though I want to live in Tokyo.
 b. *I will always live in Paris, though I hope to live in Tokyo.

Extension to compatibility restricted union. So far, we have assumed that the doxastic and buletic backgrounds that are unified with ‘hope’ in French are both internally consistent and are consistent with one another. But what happens if the full set of priorities is not consistent? As mentioned above, we think that it is most likely that this situation does not arise with the experiencer’s personal desires, but it may be that we can take on inconsistent committed desires indirectly from our other commitments. For example, we can suffer from inconsistent deontic requirements and at the same time want to satisfy those requirements. This type of case is inspired by Kratzer (1981, 1991), who uses inconsistencies to motivate the introduction of ordering sources into modal semantics. We illustrate it in (55) in the context of desire attitudes:

- (55) [I am ordered:]
 Doctor: No smoking! No drinking! Exercise!
 Psychologist: Relax! Go out for a glass of wine! Exercise!
- [I say to both:]
- a. I don’t have much time these days, but I hope to exercise.
 b. I know Doc doesn’t approve, but I ??hope (*ok*: want) to have a glass of wine.
 c. I know Doc doesn’t approve, but I ??hope (*ok*: want) to smoke a cigarette.

The set of deontic priorities in this scenario includes incompatible orders from two different authorities; the doctor prescribes not drinking, while the psychologists prescribes going out for a drink. Both agree that I must exercise. I trust both authorities and want to follow their advice. Should we consider ‘I have wine’ and ‘I do not drink’ to both be committed desires? If so, we have to deal with inconsistency in the ordering source of ‘hope’.

As it has been presented so far, our framework fails in such cases because the unification of inconsistent modal backgrounds produces an empty set of accessible worlds. However, it is possible to make technical adjustments which make sense of them, as Rubinstein (2012, 2014) does for necessity modals. Instead of unifying backgrounds by simply unioning the premise sets, we can adopt Frank’s (1996) COMPATIBILITY RESTRICTED UNION:

(56) **Unification of modal backgrounds (compatibility restricted union):**

If M is a pair of modal backgrounds $\langle f, g \rangle$:

- $\text{Unify}(M) = \lambda s. \{f(s) \cup X : X \subseteq g(s) \wedge f(s) \cup X \text{ is consistent} \\ \wedge \forall Y [(Y \subseteq g(s) \wedge X \subset Y) \rightarrow f(s) \cup Y \text{ is inconsistent}]\}$

Unifying through compatibility restricted union produces a set of backgrounds, not a single background as is the case if we unify using simple union. This difference leads to the need for some technical adjustments in the semantics for predicates that are lexically associated with a single background, as with ‘believe’. For consistency in the semantics of the indicative, they too should be associated with a set of backgrounds at the point where the indicative takes its argument. Thus, when unification applies to a single background, it creates the singleton set ($\{DOX\}$ in the case of ‘believe’):

(57) **Simplification of committed backgrounds:** For any sequence of backgrounds M and situation s with an experiencer: $\text{SPL}(M, s) =$

- (i) $\text{Unify}(M)$, if M is a pair and the experiencer of s is committed to both backgrounds in M ;
- (ii) $\{M\}$, if M is a single background;
- (iii) M , otherwise.

Our semantics for the indicative in French also needs a slight adjustment. When we use compatibility restricted union to create the unified background, the semantics for *Ind* can’t involve taking the intersection of $\text{Unify}(M)$ (i.e. $\bigcap \text{SPL}(\text{content}(s), s)$), since $\text{Unify}(M)$ is a set of backgrounds, not a single background. One option would be to use *Fav* from Rubinstein (2014), which preserves a necessity semantics for indicatives.

$$(58) \quad \text{Fav}(M) = \bigcup \{ \bigcap f : f \in M \}$$

(59) French indicative (option with compatibility restricted union):

$$\llbracket \text{Ind} \rrbracket = \lambda p \lambda s [\text{Fav}(\text{SPL}(\text{content}(s), s)) \subseteq p]$$

Note that $\text{Fav}(M)$ is equivalent to $\bigcap m$ when $M = \{m\}$, a singleton, and so *Fav* causes no problems when the unified backgrounds are consistent. According to

these definitions, (55a) comes out true, and (55b)-(55c) come out false. However, though (58)-(59) do seem to make the correct predictions in (55), this is a complex scenario, and we leave for another occasion a more detailed discussion of whether it is best to understand it in terms of inconsistent desires.

Cases of variation with French ‘hope’. Our definition of commitment relates a situation (with an experiencer) to a modal background: the experiencer E of s is committed to f if E would defend $f(s)$ in s as a basis for action. According to this definition, commitment is always assessed “locally”: we assess commitment in s towards $f(s)$. In principle we could assess commitment in s towards the the premises relevant in some other s' , $f(s')$. Here we will consider whether this possibility explains some cases of variation in French.

As mentioned in Section 1, Godard (2012, (37)) points out that French *espérer* ‘hope’, like several other verbs normally considered indicative-selectors, sometimes occurs with subjunctive, and that the use of subjunctive is more likely when the matrix verb is combined with *pouvoir* ‘can’, in a conditional *si* clause, or when in the imperative or gerund forms. Example (3), repeated here, illustrates Godard’s data with ‘can’:

- (60) On peut espérer qu’il prenne la bonne décision. (French)
 we can hope that he take.SUBJ the right decision
 ‘We can hope that he makes the right decision.’

While we consider the baseline variation with ‘hope’ to be a result of intralinguistic variation in the application of SPL, as described above, we would also like to explain why certain modal contexts further facilitate subjunctive. Our speculation is that these can be seen as constructions where there is reduced commitment to the predicate’s modal backgrounds. In the case of (60), our intuition is that ‘can’ leads to reduced commitment on the part of the experiencer (‘we’) towards contents associated with the hoping situation s .

In the presence of a quantificational modal operator like ‘can’, we can attribute reduced commitment to a dissociation between the situation in which commitment is assessed and the situation which serves as the argument of the modal backgrounds. The following is a modified denotation for indicative allowing this dissociation:

$$(61) \quad \llbracket Ind \rrbracket = \lambda p \lambda s' \lambda s [\bigwedge (\text{SPL}(\text{content}(s'), s) \subseteq p)]$$

Then we can check commitment in the overall evaluation situation s to the contents of a different hoping situation s' :

$$(62) \quad \lambda s \exists s' [R(s, s') \wedge \text{Experiencer}(us, s') \wedge \text{hoping}(s') \wedge \text{Ind}(\phi)(s')(s)]$$

In this logical form, indicative will only be possible if the experiencers are committed in s towards their desires in s' . Such commitment is not ensured by principle (35) requiring commitment towards the contents of a hoping situation. Thus, we predict subjunctive to be possible.

It is beyond the scope of our analysis here to explain how the grammar identifies the situations playing the roles of s and s' in (62); there is of course an important body of literature on the anaphoric properties of situation variables (e.g., Percus 2000, Elbourne 2005, Keshet 2010, Schwarz 2012). To do this rigorously would require a better understanding of how much of the variation in French is due to a baseline, language-wide variation between the system which simplifies sequences of backgrounds (the prescriptive French system) and one which does not simplify (the Spanish system discussed next), and how much is due to semantic factors within particular structures or pragmatic factors within particular contexts. Here we have shown that the overall system can be developed so as to allow for variation due to structural factors, in addition to grammar-wide differences.

4 The difference between French and Spanish

Now we turn to Spanish, a language where ‘hope’ as well as other predicates of committed preference like ‘intend’ and ‘plan’, take the subjunctive.²⁵ We aim to develop an analysis of the pattern in Spanish which explains the overall similarity between the mood systems of the two languages and which does not involve a semantic differences between the verbs ‘hope’ in Spanish and French. The essence of our proposal is that Spanish does not use SPL to unify backgrounds; thus, ‘hope’ contributes two backgrounds to the derivation, and so the subjunctive is required, just as it is with ‘want’. This derivation contrasts with what happens in French, where as we have seen, the backgrounds of ‘hope’ are unified into one, leading to the indicative.

Where the French moods incorporate SPL in (39)-(40), we propose that the Spanish moods lack it:

$$(63) \text{ Spanish indicative: } \llbracket Ind \rrbracket = \lambda p \lambda s [\bigcap content(s) \subseteq p]$$

$$(64) \text{ Spanish subjunctive: } \llbracket Subj \rrbracket = \lambda p \lambda s [CPR(p)(\bigcap content_2(s)) \subseteq_{<content_1(s)}]$$

These entries predict that Spanish will use subjunctive with all desire predicates, since they involve both a doxastic and a buletic background. Indicative will only be part of the derivation when the matrix predicate is lexically associated with a single background, as with ‘believe’.

The analysis instantiated by (39)-(40) in French versus (63)-(64) in Spanish captures the difference between languages with ‘hope’, as well as their uniformity with ‘want’. It also maintains the same lexical semantics for ‘hope’ in the two languages. However, it does involve a semantic difference between the mood markers in the two languages. Specifically, French incorporates SPL and Spanish does not. In Section 3, we considered not only the “official” proposal of (39)-(40), but also several variants, and each option can be seen as reflecting a different intuition about the difference between French and Spanish — and by extension, about the nature of crosslinguistic variation in this domain more generally.

²⁵Thanks for Lucia Donatelli and Tris Faulkner for discussion of the data in Spanish.

1. **Difference in the meanings of functional elements.** In the system of our main proposal, represented by (39)-(40) and (64)-(64), the difference between the languages has to do with the quantificational meaning of *Ind* and *Subj*. It fits naturally into a view of crosslinguistic variation as based on differences in the properties of functional elements.
2. **Difference in the functional structure.** In the variant approaches where SPL is introduced separately in the syntax, the difference between the languages has to do with the presence or absence of that piece of syntax or the morpheme which fills it. We would say that the functional element which introduces SPL is never present in the syntactic representation of ‘hope’ sentences in Spanish. From here, the question would be whether SPL is completely absent from the lexicon of Spanish, or whether it is absent with ‘hope’ as a lexical property of this verb, but present in other contexts.
3. **Difference in the concept of ‘content’.** In the variant approach where the operative *content* function in French is understood to incorporate simplification, the difference between languages would be that Spanish considers the content of a hoping situation to be a pair, not a simplified singleton. Compare (65) to (45):

- (65) Content of a situation (Spanish, variant):
- a. For any belief situation s , $content_S(s) = DOX(s)$
 - b. For any wanting situation s , $content_S(s) = \langle Bul(s), DOX(s) \rangle$
 - c. For any hoping situation s , $content_S(s) = \langle Bul(s), DOX(s) \rangle$

(Recall that the status of s as a wanting or hoping situation leads to differences in $Bul(s)$, because the experiencer of s must be committed to $Bul(s)$ when s is a hoping situation; thus, (65) does not imply that ‘want’ and ‘hope’ are synonymous in Spanish.) This approach would represent the view that the grammars of French and Spanish are identical, but the foundational concept of content, represented by $content(s)$, is different for speakers of the two languages.

4. **Difference in a discourse-level principle.** In the variant approach where modal backgrounds are parameters of interpretation and SPL is a discourse-level operation, the difference between languages would be in whether this discourse operation is part of the grammar of the language. Specifically, (48) would apply in French but not Spanish. This approach would connect naturally to the proposal of Mari and Portner (2018), where the difference between French and Italian with belief predicates is attributed to a discourse-level operation specific to Italian which allows the common ground to function as a second background with the subjunctive.

This brief discussion makes it clear that the formal analysis of mood variation in Romance is compatible with a variety of high level perspectives on the nature of semantic variation. While we believe that our main proposal, where the difference between French and Spanish is represented by the presence or absence of SPL in the mood morphemes' meanings, is the version which highlights our ideas most clearly, we also feel that each of the approaches discussed above is interesting and worthy of further exploration.

5 Comparisons

In this section we briefly remark on how our analysis compares to some other relevant work in the literature.

5.1 Comparison with Anand and Hacquard (2013)

Anand and Hacquard (2013) undertake a detailed study of 'hope' as part of a broader project which aims to explain the distribution and interpretation of epistemic modals in the complements of attitude verbs. While we cannot address here the complex issues that come with their focus on embedded modals, it is useful to discuss their treatment of 'hope' since it is motivated by an interesting empirical pattern and is connected indirectly to the analysis of mood. Anand and Hacquard find that 'hope' disallows epistemic necessity modals in its complement, as in (66a), but allows epistemic possibility modals (66b):

- (66) a. *John hopes that it must be raining.
b. John hopes that it might be raining. (Anand and Hacquard 2013, (59))

The pattern shown by 'hope' is different from both pure doxastic/epistemic verbs like 'think', where both *must* and *might* are allowed, and from pure desire verbs like 'want', where neither is. From this Anand and Hacquard conclude that 'hope' has a hybrid semantics, with both doxastic and preference components: "We thus see that while emotive doxastics share a preference component with desideratives, they also pattern with attitudes of acceptance in various ways, suggesting that their semantics involves a representational component as well" (Anand and Hacquard 2013, p. 27). In their view, the preference component explains the incompatibility with *must*, while the doxastic (representational) component explains the acceptability of *might*.

In our analysis, the preference and representational meanings of attitude sentences are encoded in the way that the mood morphemes relate to the contents associated with the attitude verbs, not solely in the attitude verbs, and so this way of stating what's special about 'hope' (and other emotive doxastics) is not available to us. In essence, on our analysis what's special about 'hope' is that its modal backgrounds lend themselves to serving as the arguments of either the preference operator (the subjunctive in Romance), or, once simplification has applied, the necessity operator (the indicative, which corresponds to Anand and

Hacquard’s representational attitude). In this section, we will argue that our analysis allows us to derive the key components of the denotation that Anand and Hacquard attribute to ‘hope’ from the features of its modal backgrounds that allow for this flexibility in composition.

Technical details aside, Anand and Hacquard (2013, p. 27) argue for the following denotation of ‘hope’:

emotive doxastics seem to convey three inferences about the attitude holder: a) that she takes ϕ , the proposition expressed by the complement, to be possible, b) that she prefers ϕ to its contextual alternatives and c) that each of the contextual alternatives are possible for her, and thus that she is uncertain about the truth of ϕ .

For their purposes and ours, the contextual alternatives can be taken to be simply ϕ and $\neg\phi$.

We can show that our analysis of Sections 3-4 derives each of these three inferences when we make the assumption that, when an experiencer is committed to a pair of modal backgrounds $\langle f, g \rangle$, f and g must each be consistent and they must be consistent with one another. As mentioned in Section 3, this is probably the correct assumption in our system. We take Anand and Hacquard’s three inferences in the order (a)-(c)-(b):

- (a) That the experiencer takes ϕ to be possible: In the case of ‘hope’, the backgrounds are $\langle Bul(s), DOX(s) \rangle$. The requirement that committed backgrounds be realistic then implies that some of the experiencer’s belief worlds satisfy all of the desires. Thus, ‘a hopes that ϕ ’ entails that a believes ϕ to be possible.
- (c) That the experiencer is uncertain about the truth of ϕ : In Spanish, the subjunctive creates a set of pairs of worlds which differ in the truth value of ϕ and states that this relation is a subset of $<_{Bul}$. We have also assumed in (51) that the preference order $<_{Bul(s)}$ is restricted to worlds in $DOX(s)$ for committed desires. This implies that there are worlds in $DOX(s)$ where ϕ is true and worlds in $DOX(s)$ where ϕ is false. When $DOX(s)$ and $Bul(s)$ are unified, as in French, the same fact amounts to the condition that $\bigcap(DOX(s) \cup Bul(s))$ entails ϕ but $DOX(s)$ by itself does not. The uncertainty condition therefore corresponds to a scalar inference. If $DOX(s)$ were to entail ϕ , the speaker could assert this stronger proposition with ‘a believes ϕ ’, which is simpler in its compositional derivation in as much as it does not involve a unification of backgrounds.

According to our reasoning, the inference from ‘hope’ to ‘not the case that believe’ is an implicature, and as expected it can be cancelled:

(67) I hope she visits next week, and I do believe she will.

This example may be problematical for Anand and Hacquard (2013) or any other Heim-style analysis of ‘hope’ which incorporates diversity with

respect to ϕ in $DOX(s)$ as a presupposition. However, it's not yet clear that examples like (67) prove that uncertainty with 'hope' is an implicature, since we would assume the standard diversity condition for 'want' and other desire predicates, and they also allow patterns similar to (67):

(68) I want her to visit next week, and I do believe she will.

If (68) has the same status as (67), Anand and Hacquard and other supporters of the diversity condition might apply whatever solution they develop for the former to the latter.

- (b) That the experiencer prefers ϕ to $\neg\phi$: In Spanish, which uses the subjunctive with 'hope', the comparison operator CPR creates a set of pairs of worlds which differ in the truth value of ϕ , and then the subjunctive asserts that the ϕ worlds are higher in the buletic ordering than their $\neg\phi$ counterparts. This is the fact we wish to derive. In Section 3, we observed that under reasonable assumptions simplification and a switch from subjunctive to indicative does not affect truth conditions. In French, the indicative has a necessity semantics stating that, in all worlds in which all of the experiencer's beliefs and desires hold, ϕ is true; in the context of the uncertainty inference (c), these are comparable to worlds in $\bigcap DOX(s)$ where ϕ is false, but these worlds will obviously be ranked lower by $<_{Bul(s)}$ than the ideal ϕ worlds. Thus, the preference inference follows in French as well.

If we drop the assumption that the doxastic and buletic backgrounds are consistent individually and with each other, we cannot immediately derive that the experiencer takes ϕ to be possible by the reasoning in point (a). However, point (c) implies this by reasoning that still holds when the buletic background is internally inconsistent or inconsistent with the experiencer's beliefs. To be more precise, reasoning analogous to points (c)-(b) hold under the assumption that the indicative has a necessity semantics based on the set of favored worlds, (58)-(59).

If we are correct and the three components of meaning that Anand and Hacquard propose for 'hope' can be derived from the preconditions we place on simplification, we take it that this amounts to a significant advance. Their semantic entry for 'hope' is rather complex and simply stipulates that hoping involves both preference and uncertainty. Moreover, while they make many interesting remarks which tie the analysis to the theory of mood selection, they do not actually offer a theory of the distribution of indicative and subjunctive clauses. We have offered a theory of mood selection that captures the variation with 'hope' and under appropriate assumptions, we can explain how the three inferences are derived.

Within our framework, Anand and Hacquard's pattern of embedding epistemics looks like this: when $content(s)$ is a singleton (as with 'believe'), both necessity and possibility modals are allowed; when $content(s)$ is a pair that can be unified ('hope'), possibility is allowed but necessity is not; and when

content(s) is a pair that cannot be unified (‘want’), neither necessity nor possibility epistemics are embeddable. In future work, we hope to adapt their explanation of these facts into a form that fits within the broader approach to mood represented here.

5.2 Comparison with Silk (2018)

Silk (2018) gives an analysis of mood selection in French which is, like ours, inspired by the concept of contextual commitment introduced by Portner and Rubinstein (2012). With respect to the data of particular relevance here, he accepts the intuition that the difference between ‘want’ and ‘hope’ is one of the experiencer’s commitment, but he argues that the qualitative definition of commitment offered by Portner and Rubinstein is flawed. In its place, he proposes a different, more formal definition. In this subsection, we will briefly discuss his argument and proposal.

Portner and Rubinstein define contextual commitment as follows (slightly different from the version assumed in Section 3):

- (69) **Commitment to backgrounds:** An individual a is committed to a modal background h in event e iff a is disposed/prepared in e to argue for $h(e)$ in a conversationally appropriate way (e.g., by arguing that it is rational/proper/sensible/wise) in any relevant conversation c .

Silk argues that this definition does not accurately capture the difference between ‘want’ and ‘hope’. Specifically, he states that it is possible to be committed in the sense of (69) to the desires that underly statements about what one wants. To make this point, he considers Portner and Rubinstein’s example (28), repeated here as (70).

- (70) a. I want to marry Alice and I want to marry Sue.
 b. *I hope to marry Alice and I hope to marry Sue.

According to Silk, the mere fact that the experiencer reports incompatible desires does not in fact show a lack of commitment to them:

Consider [(70)]. Pace P&R, it is possible to be committed, in the sense of [(69)], to conflicting preferences. Commitment_{PR} to conflicting preferences simply requires that the subject be prepared to defend each preference as “reasonable and appropriate” (2012: 462) in any relevant conversation. One can imagine our torn lover in [(70)] saying, “It would be reasonable for me to marry Alice. We have such deep conversations, and we’ve been through so much together. Yet it’s Sue that I can’t stop thinking about. It would be reasonable for me to marry her, too. I adore each of them, and I’m sure I would be happy either way. What to do!” Such a state of mind might incur a practical conflict, but it isn’t impossible.” (Silk, 2018)

However, (69) does more than require the subject to be prepared to defend each preference; note that (69) doesn’t refer to the elements of the premise set $h(e)$,

but to $h(e)$ itself. In other words, it requires that the subject be prepared to defend the set of preferences $h(e)$ as a whole. And in the case at hand, one would certainly not defend the entire set of preferences as a basis for action — as Silk’s torn lover shows us by lamenting “*What to do!*”

Silk also argues that some uses of ‘hope’ fail to meet the criterion of contextual commitment (Silk 2018, (22)):²⁶

- (71) Bert doesn’t fully realize it yet, but he hopes his wife doesn’t end up getting the job, so that she can stay home with the kids.

According to Silk, this example poses a challenge because it seems that Bert would not (yet) be disposed or prepared to argue in favor of a preference for his wife to stay home with the kids, since he has not realized that he holds this preference. It is not clear to us that this case is a problem, however, since what definition (69) requires is that Bert be disposed in e to defend his preference; given that the hoping event e is only one piece of his complex mental state, this does not rule out that he might not be disposed overall to defend it. There might be other, stronger dispositions associated with other events and states of which Bert is the experiencer, and these prevent him from realizing the argument in favor of the preference we are focusing on. (To take an extreme case, it would obviously not be an argument against the definition of commitment that one can contradict one’s beliefs under threat of violence.)

If we step back for a moment to evaluate this debate so far, it seems to us that Silk’s argument with regard to (70) is not effective, but that the point pertaining to (71) is useful. While it does not show that Portner and Rubinstein’s definition (69) is incorrect, it does reveal that the definition sometimes fails to provide a clear criterion for determining what someone is committed to in context.

Silk offers an alternative to Portner and Rubinstein’s definition of commitment. It is based on the assumption that there exists a distinguished pre-ordered set of worlds $\text{SoM}(e)$, the STATE OF MIND of e , for each content-bearing event of someone’s mental life. Silk proposes that we define commitment towards a pair of modal backgrounds $\langle f, g \rangle$ in terms of their relation to the state of mind. Specifically:

- (72) The experiencer of e is committed towards $\langle f, g \rangle$ in e iff the pre-ordered set of worlds derived from $\langle f, g \rangle$ in e is a sub-order of $\text{SoM}(e)$:

$$\bullet \quad \langle \bigcap f(e), \leq_{g(e)} \rangle \trianglelefteq \text{SoM}(e)$$

²⁶Silk also argues that “he doesn’t realize it yet” also creates a problem for the analysis of doxastic predicates. Even though ‘believe’ takes the indicative in French, (i) seems to show that one can fail to be aware of one’s beliefs (Silk’s (20)):

- (i) Bert doesn’t fully realize it yet, but he thinks that women are less capable than men in the workplace, and that their proper place is in the home.

This would seem to show that ‘think’ lacks contextual commitment. (Ideally we would see data with English ‘believe’ and French *croire*.) We can ignore this issue here, though, because on the present analysis it is not relevant whether ‘believe’ involves commitment. According to the analysis developed in this paper, the fact that ‘believe’ is only associated with a single background (whether committed or not) would be enough to predict its mood selection in French. Of course matters are different in Italian, as discussed by Mari and Portner (2018).

As in Portner and Rubinstein’s analysis, a predicate requires the indicative when the experiencer is committed towards the modal backgrounds that figure in the semantics of the predicate.

Before giving a brief evaluation of Silk’s proposal, we can make two points regarding the relation between the state of mind approach to commitment and our proposals in this paper. First, Silk’s theory as stated runs into severe problems when confronted with patterns of variation in mood selection. While he gives some ideas about dealing with variation (Silk 2018, Sect. 6), none of them are useful for the case at hand. He suggests that, when languages differ in mood selection, either the indicative mood or the mood-selecting verbs could have different meanings. The first option would state that the indicative is sensitive to the state of mind of a different event than in French (i.e., other than the wanting/hoping event), or that the logical relation between $\langle \bigcap f(e), \leq_{g(e)} \rangle$ and SoM is something other than \leq . We do not see how either of these ideas could lead to subjunctive with both ‘want’ and ‘hope’ in Spanish while capturing the significant overall similarity between the two languages. The second option would state that ‘hope’ has a different meaning in Spanish than in French, something for which we see no evidence. These difficulties result from the fact that Silk’s analysis, like most others, explains mood selection in terms of the actual meanings expressed by verbs and other triggers. In contrast, in our analysis, mood selection is explained in terms of the compositional process, something which is of course tied to lexical meanings, but which allows for a restricted range of variation when type shifts, coercion, and other operators come into play.

The second point we’d like to make about the relation between Silk’s analysis and ours is that his definition could easily be incorporated into our analysis of mood variation. We have given a system based on the idea that a pair of committed backgrounds can be unified into one (leading to indicative), and if one believes that something like (72) represents the correct way to define commitment, it could certainly be used as the precondition for unification.

We will conclude by briefly discussing why we are not persuaded by Silk’s proposal to define commitment as in (72). His theory relies on there being, for each event which is the argument of a sentence-embedding verb, an objective and consistent way of identifying the state of mind $\text{SoM}(e)$. It cannot be that we simply stipulate, for each type of event e , what $\text{SoM}(e)$ is, since in that case the commitment requirement would not hold any explanatory value. When the concept of state of mind is more formally introduced, he says “SoM is a partial function from events e to pre-ordered sets of worlds representing the informational-evaluative content of the state of mind characterizing e ” (p.144), but this does not seem in general to lead to the intended results. For example, while it is reasonable to assume that the modal state characterizing a belief event is $\text{DOX}(e)$ (which predicts indicative), Silk would run into trouble if he were to apply this definition to desire predicates. He assumes that ‘hope’ and ‘want’ are associated with the same state of mind (p.147), namely $\langle \text{DOX}(e), \leq_{\text{Bul}(e)} \rangle$, while at the same time assuming that wanting and hoping are different attitudes. Thus, the state of mind cannot be simply the modal state “characterizing” an

event. In fact, in discussing ‘hope’ and ‘want’, Silk shifts the explanation of state of mind, describing it in these cases as the “overall state of mind” of the experiencer of e , rather than the state of mind characterizing e .

The notion of an “overall state of mind” is problematical. With ‘hope’ and ‘want’, the overall state of mind is assumed to be $\text{SoM}(e) = \langle DOX(e), \leq_{Bul(e)} \rangle$, but this does not correspond to the naive meaning of “overall state of mind”.²⁷ For one thing, the overall state of mind would naturally be thought of as something global, capturing everything in the individual’s cognitive state including memories, sensations, and emotions, rather than just one pre-ordered set limited to the belief worlds. For another, even focusing in on beliefs and desires, the definition of SoM does not capture everything, since one’s preferences about possibilities which one assumes to be impossible are part of one’s overall state of mind in a desire event. Indeed, Silk’s (2018) explanation of subjunctive with ‘want’ relies on the Heimian assumption that the modal base for ‘want’ is a superset of $\bigcap DOX(e)$; therefore, one would have to conclude that the overall state of mind in e involves more than the pre-order defined from $\langle DOX(e), \leq_{Bul(e)} \rangle$.

Even if we assume that the concept of overall state of mind is reasonable when applied to belief/desire events, it is still necessary to choose a different definition with other types of events. With ‘say’ $\text{SoM}(e) = CG(e)$, the common ground of the conversation of which e is a part, but $CG(e)$ is not the speaker’s overall state of mind. Likewise, with ‘dream’ $\text{SoM}(e) =$ the set of propositions giving the content of the dream (perhaps paired with an ordering giving the in-dream preferences of the experiencer). The theory must stipulate, on a case by case basis, what backgrounds play the role of $\text{SoM}(e)$ in (72). In fact, Silk notices (p. 153) that $\text{SoM}(e)$ must be defined differently for a belief/desire event and a communication event, and this still leaves the problem of how it is defined with other attitude events like imagination events and perception events.

As discussed by Portner (2018a), many theories of verbal mood have faced essentially the same problem as the one presented by Silk (2018). For example, the important analysis of Giannakidou (1994, 1997) associates the indicative with VERIDICALITY, defined as an entailment relation between the INDIVIDUAL MODEL associated with a predicate and the proposition in the scope of that predicate. Silk’s concept of state of mind plays a role very similar to the individual model. On Giannakidou’s analysis, ‘believe’ selects indicative because its individual model is the subject’s doxastic alternatives (and so, if x believes p is true, p is veridical with respect to the individual model); in contrast, ‘want’ selects the subjunctive because its individual model is doxastic as with ‘believe’, but x wants p is not veridical with respect to the individual model in this case. Other indicative-selectors meet the veridicality criterion because their individual models have a close relation to the semantics of the verb itself; for example ‘say’ has an individual model which represents the common ground of the reported conversation and ‘dream’ has an individual model that represents the content of the dream. The similarity between Silk’s and Giannakidou’s analyses should

²⁷In Silk’s (2018) terms, the state of mind would not be the pair of modal backgrounds but the pre-order derived from them (p. 144).

be apparent.

In order for Silk’s analysis to have predictive power, it would have to include an independent and non-circular basis for identifying $\text{SoM}(e)$, for any event e that has an associated state of mind. One way to do this would be simply to stipulate universals of lexical semantics, for example that the state of mind for all desire verbs is $\langle \text{DOX}(e), \leq_{\text{Bul}(e)} \rangle$. Another would be to give a deeper definition of SoM which independently identifies the correct backgrounds in all cases; however, given the fact that many scholars have failed to solve this particular problem, we are doubtful that such a definition is possible.

5.3 Comparison with Condoravdi and Lauer (2016)

In exploring the difference between ‘hope’ and ‘want’, we raised the question of whether, and how, the notion of commitment we have incorporated into our analysis is related to the notion of Effective Preferences developed by Condoravdi and Lauer (2016) in recent work on the contribution of *want* to the interpretation of anankastic conditionals and related constructions. Both committed priorities and EPs need to be realistic and consistent, but we suggested, noting hopes that pertain to coin tosses and other non-controllable processes (see (32a)), that *hope* can rely on priorities that are not action-guiding. In this section we will touch on the more general question that such examples raise, concerning the connection between commitments and actions.

While it may be true that rational agents typically act upon their goals in order to realize them, commitments and actions are independent concepts to the extent that it is possible for an individual to hold on to their commitments while knowingly (perhaps, temporarily) acting in a way that undermines them. The behavior of ‘hope’ in such cases is complex. On the one hand, it seems impossible to use ‘hope’ with a conjunction of incompatible priorities, as in (73a). On the other hand, things improve without conjunction: both the committed priority (73b) and the anti-commitment effective preference (73c) can be described with ‘hope’ in separate statements.

- (73) [Sheila is an academic who loves nature and is committed to protecting the environment.]
- a. ?? Sheila hopes to minimize her carbon footprint this year and to fly around the globe in September.
 - b. Sheila hopes to minimize her carbon footprint this year.
 - c. Sheila hopes to attend a conference in Norway in September and fly from there to the Galapagos for vacation.

It seems that the context of conversation matters in this case. (73c) would be felicitous in a conversation with colleagues where the contextual commitments are work-oriented, but infelicitous in a conversation between environmentalists who are committed to minimizing their individual carbon footprints.

If it can be argued that Sheila’s EPs in the given scenario entail taking the long flights and that these EPs reflect her personal goals and remain stable

regardless of the commitments of the conversational participants, the example supports the commitment approach. We can use anankastic conditionals with ‘want’ and ‘hope’ to probe these assumptions. If Condoravdi and Lauer (2016) are right about the analysis of anankastic conditionals, one would expect to be able to construct an anankastic interpretation of ‘want’ in the flights context in (73) based on Sheila’s purported effective preference for travel.

- (74) a. If Sheila wants to fly to the Galapagos, she should buy tickets today.
b. If Sheila wants to fly to the Galapagos, she should leave the group.

Our judgments about these sentences are surprising under the EP view, since it seems that the anankastic interpretation of (74a) depends on the commitments of the conversational participants (and not on the agent’s EPs). To see that it’s the conversational participants’ commitments that matter, observe that the sentence would be felicitous in the work-oriented conversation but not in the conversation between the environmental activists. In that context the non-anankastic (74b) would be felicitous and natural.

We think that (74a) is infelicitous in the conversation among the environmentalists due to the use of ‘should’, a weak necessity modal, in the conditional consequent. Rubinstein (2014) proposes that negotiable priorities, which rank possibilities without removing any from consideration, do two things in a discourse: they describe priorities endorsed by an assessor (in the case at hand, the speaker), while implying recognition that conflicting priorities may be relevant and ultimately accepted as commitments in the conversation. An environmentalist would not conversationally endorse or promote the priority of flying around the globe, and following Rubinstein’s analysis (74b) but not (74a) is expected to be felicitous in this context.

We will not be able here to explore the full pattern of interactions between desire predicates and necessity modals in anankastics. We summarize the discussion by noting that judgments in the flights scenario remain the same with ‘hope’ instead of ‘want’ in the antecedents of (75), in line with the commitment analysis of necessity and desire advocated here.

- (75) a. If Sheila hopes to fly to the Galapagos, she should buy tickets today.
b. If Sheila hopes to fly to the Galapagos, she should leave the group.

When the contextual commitments in the conversation include the hypothetical priority described within the antecedent, an anankastic interpretation is available and ‘should’ is teleological ((75a) in the work-oriented conversation). Otherwise, ‘should’ expresses the speaker’s opinion (here, a deontic judgment) regarding the hypothetical committed desires described in the antecedent ((75b) in the environmentalist conversation).

6 Conclusion

We have provided a new analysis of the crosslinguistic difference in mood selection with ‘hope’ between French, where it takes the indicative, and Spanish,

where it takes the subjunctive; and we have explained the difference between ‘hope’ and ‘want’, where the former shows such crosslinguistic variation and the latter does not. As far as we know, no other proposal is able to capture this pattern without resorting to a lexical semantic difference between the verbs ‘hope’ in the two languages.

Our analysis builds on the commitment theory of mood selection recently promoted by Portner and Rubinstein (2012) and Silk (2018), but it incorporates commitment through an operation of simplification of modal backgrounds following Rubinstein (2012, 2014); in brief, we propose that two backgrounds can be combined into one when the experiencer is committed to both. This allows us to explain the effect on mood choice in terms of the argument structure of mood morphemes: indicative takes one background as argument, while subjunctive takes two. When two backgrounds are unified, the overall meaning is not affected, but the semantic composition changes, and this change is revealed in mood morphology. Our theory also has the advantage of allowing us to dispense with the need for *ad hoc*, complex mechanisms of selection between the matrix verb and the mood morpheme in its complement.

Our analysis of mood selection suggests a new way of thinking about the interaction of beliefs and desires in the expression of attitude. When committed desires are unified with the doxastic base of a predicate like ‘hope’, we propose that a single modal background represents the attitude holder’s combined beliefs and desires, and there is no ordering of possible worlds or comparison of possibilities. This idea provides the key to explaining why ‘hope’ sometimes (for instance, in French) behaves like a representational attitude in terms of mood selection, despite having clearly a preferential semantics (to use Bolinger’s 1974 terms). The principles of commitment that underly mood selection under our approach and their formal implementation are the same as those that shape quantificational domains of necessity modals according to Rubinstein (2012, 2014), and the fact that they fit directly into the blueprint of the widely-assumed comparison-based theory of verbal mood lends support to a commitment-based split among modal expressions in general: among modals and attitude verbs, there are ones that involve commitment and are formally non-comparative, and ones that are not fully committed to and comparative.

Along with the recent proposal by Mari and Portner (2018) about belief predicates in French and Italian, our analysis opens up a new way of looking at crosslinguistic and intralinguistic variation in mood selection, and more broadly in modal semantics. Besides the simplification operation, our analysis involves a couple of other nonstandard devices. First, building on Portner (1997), Kratzer (2013), and Mari and Portner (2018), we treat the verb as contributing only modal backgrounds to the semantics, and the mood morphemes as introducing the quantificational structure which uses those backgrounds. And second, we employ a version of Heim’s *SIM* semantics where the relation of comparison between similar worlds is constructed across the modal base (as $CPR(\phi)(B)$), with the other background giving the interpretation of that ordering. Thus, there are several degrees of freedom in giving the semantics of a modal construction: the source of the backgrounds (from a verb, other linguistic material,

or context), the operations which manipulate the backgrounds (like SPL), and the expression of the comparison operation. In our main proposal, we package *CPR* and *SPL* into the mood morphemes, and derive the backgrounds from the situation argument of the verb, following the event relativity hypothesis. In our discussion, we raised other options for each of these points, and we feel that each of them is likely to prove useful when we address other patterns of mood selection in this framework.

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