

## Co-anchoring with the matrix clause: French verbal mood and German V2<sup>1</sup>

Hubert TRUCKENBRODT— *Leibniz-Centre for General Linguistics and Humboldt-University Berlin*

**Abstract.** In complement clauses, the French indicative and German V2 place similar semantic restrictions on their matrix verbs. In adjunct clauses, the French indicative and German V2 differ: French indicative adjunct clauses can be genuinely embedded, German V2 adjunct clauses cannot, and must follow their host clause. The analysis builds on a decomposed left periphery with *Force* > ... > *Fin* (Rizzi, 1997). The similarity in complement clauses is reduced to an attitudinal anchor [i] with a verbal mood feature in *Fin*, which is shared by the French indicative and German V2. The presupposition of this feature, due to Schlenker (2005), restricts the matrix verbs. The difference in adjunct clauses is argued to support a new mechanism for how the index [i] of this presupposition connects to the perspective holder in the matrix clause. Modifying a suggestion of Heim (2005), movement of *Fin*[i] to *Force* is argued to create a relative clause structure for perspective, interpreted by predicate abstraction. Where it occurs, it can take the matrix verb as its “external head”. For French, this leads to an account of embedded indicative adjunct clauses. In addition, the distribution of indicative vs. subjunctive in indefinite relative clauses (Farkas, 1985) is explained. For German V2, the restriction on adjunct clauses follows if German V2 is an overt instance of perspectival relative clause formation. This is connected to independently motivated properties of verb movement in V2-clauses, in an extension of the suggestions of Sode and Truckenbrodt (2018).

**Keywords:** verbal mood, V-to-C movement, attitude verbs, perspective, French, German.

### 1. A comparison of the French indicative with German V2

This section introduces some similarities and differences between the French indicative and German V2 order. The remainder of the paper motivates an analysis of verbal mood that leads to an account of the observations in this section.

#### 1.1. Similarities in complement clauses

In French, indicative verbal mood is a central component of a declarative. In German, V2 word order is a central component of declaratives. Both can also occur in the complement clause of the verbs *say*, *believe*, and *dream* as shown in (1) and (2) (see Meinunger, 2004 and Portner, 2006 on the parallel). In French, the indicative regularly excludes the use of subjunctive for expressing the same meaning (Portner, 1997; Schlenker, 2005). In German, embedded V2 clauses exist side by side with embedded V-final clauses, the standard shape of em-

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bedded clauses (Reis, 1997). They express the same meaning in the cases relevant here. The German clauses are shown with both indicative and reportative subjunctive (morphologically Konjunktiv I), which also carry the same meaning in the embedded clauses relevant here.

- (1) a. Jean dit / pense que Léa **est/\*soit** là.  
 Jean says / thinks that Léa is.IND/SBJV there
- b. Jean rêve que Léa **est/soit** là. (*sbjv*: only irrelevant wish-reading)  
 Jean dreams that Léa is.IND/SBJV there
- (2) Lukas sagt/glaubt/träumt, Lisa **ist/sei** da / dass Lisa da **ist/sei**.  
 Lukas says/believes/dreams Lisa is.IND/KONJ there / that Lisa there is.IND/KONJ  
 ‘Lukas says/believes/dreams that Lisa is there.’

The matrix predicates *want*, *demand*, and *it is possible* embed neither French indicative nor German V2. In French, the subjunctive must be used in the complement clause, as in (3) and (4). In German, a V-final clause must be employed, as in (5) and (6).

- (3) Luc veut/demande que Léa **\*est/✓soit** là.  
 Luc wants/demands that Léa is.IND/SBJV there
- (4) C’est possible que Léa **??est/✓soit** là.  
 It-is possible that Léa is.IND/SBJV there
- (5) Lukas will/fordert, dass Lisa da **ist/sei** / Lisa **\*ist/\*??sei** da.  
 Lukas wants/demands that Lisa there is.IND/KONJ / Lisa is.IND/KONJ there  
 ‘Lukas wants/demands that Lisa is there.’
- (6) Es ist möglich, dass Lisa da **ist/sei** / Lisa **\*ist/\*sei** da.  
 it is possible that Lisa there is.IND/KONJ / Lisa is.IND/KONJ there  
 ‘It is possible that Lisa is there.’

On Romance indicative, see also Farkas (1985, 1992), Quer (2001), Giannakidou (2009), Schlenker (2005), and Portner (2011, 2018). On German V2, see also Gärtner (2000, 2002), Truckenbrodt (2006a, b), and Sode and Truckenbrodt (2018).

## 1.2. Differences in adjunct clauses

I subsume relative clauses and adverbial clauses under the term adjunct clauses. They are not selected. The similarity between French and German does not extend to these. French indicative adjunct clauses can occur in embedded positions. Thus, the French indicative is the standard mood in restrictive relatives inside definite and quantified DPs as in (7) and (8).

- (7) Le touriste [à qui j’ai parlé] vient de Québec.  
 the tourist to whom I-have.IND talked comes from Quebec  
 (Hawkins and Towell, 1996:356)

- (8) Il n'y a personne [qui **vient** me voir]. (Lalaire, 1998:320)  
 it not-there has nobody who comes.IND me see  
 'There is nobody who is coming to see me.'

Further, French indicative adverbial clauses can be in the scope of a matrix clause negation:

- (9) [Pierre boit cette mixture, parce qu'elle est bonne.]  
 'Pierre drinks this mixture because it is.IND good.'  
 Il ne la boit pas [parce qu'elle **est** belle]. Neg >> Cause  
 he NEG it drinks NEG because C-it is.IND pretty  
 'He doesn't drink it because it is.IND pretty.'

In German, on the other hand, restrictive relative clauses with definite and quantified DPs are allowed with V-final word order, but not with V2 word order (Gärtner, 2000).

- (10) Das ist der Tourist, mit dem ich gesprochen **habe** / \*mit dem **habe** ich gesprochen.  
 that is the tourist with whom I talked have / with whom have I talked  
 'That is the tourist to whom I talked.'  
 (11) Es gibt niemanden, der mich besuchen **kommt** / \*der **kommt** mich besuchen.  
 it exists nobody who me visit comes / who comes me visit  
 'There is nobody who comes to visit me.'

Similarly, German adjunct clauses embedded under negation can only have V-final word-order as in (12) and not V2 word order as in (13) (see Wechsler, 1991 for Swedish, Antomo and Steinbach, 2010 for German).

- (12) [Peter trinkt die Mixtur, weil sie gut schmeckt.]  
 'Peter drinks the mixture because it tastes good.'  
 Er trinkt sie nicht, [weil sie gut **aussieht**]. Neg >> Cause  
 he drinks it not since it good PRT.looks  
 'He does not drink it because it looks good.'  
 (13) [Peter trinkt die Mixtur, weil sie gut schmeckt.]  
 'Peter drinks the mixture because it tastes good.'  
 a. #Er trinkt sie nicht, weil [sie **sieht** gut **aus**]. \* Neg >> Cause  
 he drinks it not since it looks good PRT  
 b. #Er trinkt sie nicht, denn [sie **sieht** gut **aus**]. \* Neg >> Cause  
 he drinks it not since it looks good PRT

There are, arguably, both German V2 relative clauses and V2 adverbial clauses (Gärtner, 2000). For example, (11) is grammatical with V2-order in the relative clause if *niemanden* 'nobody' is replaced with *jemanden* 'somebody'. Further, (13a,b) are acceptable in other contexts, where the V2 adjunct clause scopes over the matrix clause negation. These V2 relative clauses and V2 adverbial clauses obey fairly strict restrictions: They are assertive in nature, must not be genuinely embedded, which is relevant here, and they must

follow their host clause (Gärtner, 2000; Hinterhölzl, in press; see also Wechsler, 1991).

Why are the two phenomena similar in complement clause position, but different in adjunct clauses? The distinction is argued to motivate a new element in the theory of logophoricity.

## 2. Elements of the analysis

The morphosyntactic underpinnings of the analysis of verbal mood and V2 are first introduced in sections 2.1 and 2.2. They provide a crucial frame for the argument for *p-relativization*, an analysis of how some logophoric elements find their antecedents outside of the CP. After the introduction of semantic elements of the analysis in sections 2.3. and 2.4., the following sections 3 and 4 develop p-relativization and its applications.

### 2.1. Background to the morphosyntactic analysis of verbal mood

Schlenker (2003, 2005) developed a logophoric analysis of verbal mood. The representation of verbal mood included an index and verbal mood features. The index and the features were attached to syntactic world variables in situ, close to the occurrence of the verbal mood morphology. Sode and Truckenbrodt (2018) developed a revised logophoric account of German verbal mood and V-to-C movement from elements of Schlenker's account. This account is illustrated in (14), using an English sentence as a model for the French examples in (1a). The index is here located in C. Like the index in Schlenker (2003), it refers to anchors (or contexts) of the form  $\langle x, t, w \rangle$ , which are simplified to  $\langle x, w \rangle$  below.<sup>2</sup> (14) shows that this index relates the verbal mood interpretation to the matrix clause – in this illustration: to the matrix verb. The index in C carries interpreted verbal mood features, here the feature [+bel]. It is in a syntactic agree-relation with a corresponding uninterpreted verbal mood feature on the finite verb. [+bel] relates the index to beliefs and occurs on declaratives. [-bel] relates the index to preferences and is present in imperatives.<sup>3</sup>

- (14)
- |  |   |
|--|---|
| verbal mood<br>interpretation  | verbal mood morphology  |
|  |   |
| Luc believes <sub>[i]</sub> that- <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">[i][+bel]</span> Lea is <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">[+bel]</span> there. |   |
| coindexing<br>see Schlenker (2005)   | agree-relation and features,<br>see Sode and Truckenbrodt (2018), building on<br>Schlenker (2003, 2005) |

Sode and Truckenbrodt also employ a second verbal mood feature [ $\pm$ origo] for German. For example, the imperative inherently expresses an actual request by the speaker at the speech-time in German (see e.g. Schwager, 2006). The imperative operator is [i][-bel][+origo]. Here [-bel] relates the index to preferences and [+origo] requires that the index refers to the

<sup>2</sup> Schlenker (2005) proposed indices that refer to speech- or thought-events. In early talks of the current author and in Sode (2014), it is argued that beliefs are indexed.

<sup>3</sup> The features of Sode and Truckenbrodt (2018) – in terms of beliefs on the one hand and reference to Kaplan's context on the other – draws on the meaning of the feature [ $\pm$ indicative<sup>2\*</sup>] of Schlenker (2003) and on the meaning of the French indicative in terms of an anchored context set in Schlenker (2005).

utterance context (Kaplan, 1989), so that  $\langle x,t,w \rangle = \langle C_{Sp}, C_T, C_W \rangle$ . In German, the feature [-origo] characterizes the reportative Konjunktiv, which is [i][+bel][-origo], i.e. relates to beliefs of a third person or past beliefs or modally shifted ones (see Schlenker, 2003, and for detailed argumentation Sode, 2014). The German indicative in C is tentatively classified as [i][+bel][+origo] by Sode and Truckenbrodt; there is evidence in many configurations that it is specialized to the expression of actual speaker-beliefs, though there are two as yet not well-understood exceptions to this; one of them is the occurrence under the verbs in (2), where the indicative relates to the beliefs of the matrix subject. The other one may be described as involving sentences like in (2), though with the matrix clause turned into a V1-parenthetical. All this is distinct from the French indicative, which is, in an obvious way, not specified for [±origo], i.e. it can relate to actual beliefs by the speaker or to other beliefs alike.

In the theory of Chomsky (2008), an agree-relation is a prerequisite for overt movement. The agree-relation may also occur without movement. This is the case in (14), the model of the French examples in (1a). The finite verb stays in situ. On the other hand, the agree-relation may be followed by overt movement. Sode and Truckenbrodt argue that German V-to-C movement is correlated with an agree-relation for verbal mood. This is illustrated in (15), following the assumptions about feature interpretability and valuation in Pesetsky and Torrego (2007). The German indicative is the feature combination [+bel][+origo], as in (15a). The output of agree and move is shown in (15b): the features in C receive the values [+bel][+origo] from the finite verb via agree and the finite verb *hat* ‘has’ is in C. Movement to Spec,CP is shown in (15c). (German V2 is standardly analyzed as a combination of V-to-C movement and movement to Spec,CP. Underlyingly, the verb is in clause-final position.)

- (15) a. C-[i][±bel][±origo]      es gestern geregnet **hat**[+bel][+origo]  
   it yesterday rained    has.GERMAN-IND
- b. C-[i][+bel][+origo]-**hat** es gestern geregnet
- c. **Es** C-[i][+bel][+origo]-**hat** gestern geregnet
- ‘It rained yesterday.’

Genuinely embedded V-final clauses in German (such as restrictive relatives or embedded adjunct clauses) do not carry [i] in C in the account of Sode and Truckenbrodt. The reader is referred to Sode and Truckenbrodt (2018) for suggestions about the licensing of the finite morphology in V-final clauses in terms of long-distance agree relations, not relevant here.

## 2.2. Morphosyntactic developments of the earlier accounts

The current comparison of French and German suggests refinements of the morphosyntactic analysis, which are laid out in this section.

The distinction between French indicative and German V2 is in part correlated with a distinction in root clause status. German V2-clauses are root clauses (Hooper and Thompson 1973, Heycock 2006): they don’t occur in embedded positions except as complements to the class of verbs illustrated in (2). French indicative, on the other hand, is not a root phenomenon, since it can occur in genuinely embedded positions, such as in restrictive relatives and genuinely embedded adverbial clauses. In the split CP analysis of Rizzi (1997),

Haegeman (2004) argues that root clauses are ForcePs with speaker anchoring in their Force head. In the analysis of Sode and Truckenbrodt (2018), the index-feature combination  $[i][\pm\text{bel}][\pm\text{origo}]$  is developed as a way of making Haegeman's speaker anchoring in Force concrete.

In the current comparison with French, the analysis of the preceding section is refined. The new elements are given in (16) – (18). The different lexical specifications for core verbal mood categories are shown in (16). I hypothesize that  $[i][\pm\text{bel}]$  is located in Fin and that  $[\pm\text{origo}]$  is located in Force, as shown in (17). I further hypothesize that Force $[\pm\text{origo}]$  attracts overt movement, while Fin $[\pm\text{bel}]$  does not, as in (18), across French and German.

- |         |  |   |
|---------|--|---|
| (16) a. | German verbal mood specifications<br>(from Sode and Truckenbrodt 2018) | imperative: $[-\text{bel}][+\text{origo}]$<br>indicative: $[\text{bel}][+\text{origo}]$<br>rep. Konjunktiv: $[\text{bel}][-\text{origo}]$ |
| b.      | French verbal mood specifications                                      | imperative: $[-\text{bel}][+\text{origo}]$ (see below)<br>indicative: $[\text{bel}]$<br>subjunctive: $\emptyset$ (see below)              |
- (17) Force      Fin      TP  
 $[\pm\text{origo}]$      $[i][\pm\text{bel}]$

- (18) An agree-relation involving  $[\pm\text{origo}]$  in Force requires overt movement to Force.

The French indicative is specified for  $[\text{bel}]$  but not for  $[\pm\text{origo}]$ . It thus requires only a Fin-head Fin $[i][\text{bel}]$  to agree with. The Force layer with  $[\pm\text{origo}]$  does not need to be invoked. Consequently, French indicative clauses do not need to be root clauses. By contrast, the German indicative and Konjunktiv (as well as the imperative) are specified for  $[\pm\text{origo}]$ <sup>4</sup> in situ. In V1/V2-clauses, this enters into an agree-relation with  $[\pm\text{origo}]$  in Force. By (18), this will trigger overt movement to Force, i.e. V-to-C movement. The resulting clauses are ForcePs, i.e. root clauses.<sup>5</sup>

This little system receives initial support from a comparison with the French imperative. It is arguably specified for  $[\text{origo}]$  – it is inherently tied to a speaker-request to the addressee at the time of speech. The  $[\text{origo}]$  specification agrees with  $[\pm\text{origo}]$  in Force. By (18) this requires overt movement of the imperative to Force. This expectation is borne out. The French imperative verb moves to C in non-negated imperatives (Hulk, 1996). This results in inversion of the verb with all clitic pronouns. Thus, while the indicative verb in situ follows clitic pronouns as in (19a), the non-negated imperative precedes them as in (19b).

- |         |  |    |                                     |
|---------|--|----|-------------------------------------|
| (19) a. | Tu le lui      donnes<br>you it her/him give.IND | b. | Donne-le-lui<br>give.IMP-it-her/him |
|---------|--|----|-------------------------------------|

<sup>4</sup> I write  $[\pm\text{F}]$  for indicating 'either value' and  $[\pm\text{F}]$  for indicating 'no value' (or in "the feature  $[\pm\text{F}]$ ").

<sup>5</sup> This analysis is compatible with the V2 typology of Wolfe (to appear), in which German V2 involves the finite verb in Force, while a range of medieval Romance languages moved the finite verb to Fin without moving it to Force. The trigger of movement to Fin in these medieval Romance language remains open here.

We thus have the following clausal heads, with overt movement (or its absence) following from the lexical verbal mood specifications (16) and from (18) in this limited domain:

(20) French indicative: Fin[i][±bel] ... V[+bel]

- no overt movement to Fin required by (18)

French imperative: Force[±origo] Fin[i][±bel] ... V[-bel][+origo]

- overt movement of imperative verb to Force due to (18)

German V2-clause: Force[±origo] Fin[i][±bel] ... V[+/-bel][+/-origo]

- overt movement of finite verb to Force due to (18)

Hooper and Thompson (1973) showed that the distribution of root clauses is semantically restricted: they occur in assertive environments. This allows them to occur as complements to assertive-like verbs such as the ones in (1) and (2) and it allows them to occur unembedded (such as in declaratives), where they are themselves asserted. We are thus out for a semantic account of the restrictions on V2-clauses and the distinction to the French indicative. The classification as ForcePs is merely a syntactically motivated starting point for this, not yet an account of the restrictions on their embedding.<sup>6 7</sup>

I also briefly address the filling of Spec,ForceP in deriving the German V2 word order. I follow essentially Tsiknakis (2016), in different terms. Setting wh-phrases and relative pronouns aside, the configuration [i][+bel][+/-origo] in a declarative attracts an element to Spec,ForceP. In (21), I assume that Force[i][+bel][+/-origo] is formed by V-to-C movement.

(21) In the absence of an interrogative Q, the configuration [i][+bel][+/-origo] in Force requires filling Spec,ForceP in German.

Thus, the V2 clause type is the standard declarative ([i][+bel][+/-origo]), while V1 clause types are imperatives ([i][-bel][+origo]) and yes-no questions, which have interrogative Q.

The following structural similarities and differences will be important:

- (22) a. The French indicative and German V2 share the specification [i][+bel] in Fin.  
 b. German V2 requires movement to Force[±origo]; the French indicative does not.

### 2.3. Background to the semantic analysis

Portner (1997) and Schlenker (2005) argued that the French indicative is semantically interpreted, and that the subjunctive has no meaning and is used when the indicative cannot

<sup>6</sup> Next to V2-clauses (ForcePs with V-to-C) German also has V-final root clauses (ForcePs without V-to-C), see Truckenbrodt and Sode (in press). In the current paper, I focus on German V2 and the French indicative.

<sup>7</sup> The account in Sode and Truckenbrodt (2018) is the first formal semantic account of root clauses. In this account, root clauses are ForcePs headed by [i]. A refinement is called for in the comparison with the French indicative, which shares the root clause restrictions in complement clauses but not in adjunct clauses.

be employed to express the same meaning. Schlenker (2005) attributed the competition to *maximize presupposition* (Heim 1991). These suggestions are adopted here (see (16b)). I leave open why there is no comparable competition between V2 and V-final German clauses.

In the analysis of Romance verbal mood by Farkas (see e.g. Farkas, 1985, 1992), beliefs and the truth of a proposition for an individual play a central role. Fictional predicates like *dream* are discussed as unexpected members of the same family of predicates – one does not take to be true what one dreams – to which the notions can nevertheless be extended. This line of thought is developed in terms of formal individual models and the notion of veridicality in the writings of Giannakidou (see e.g. Giannakidou, 2009). Portner (2018) remarks that arbitrariness arises in drawing a line, in these terms, between e.g. dreaming and wanting.

This might be improved if these intuitions are pursued in connection with the decomposition of attitudinal meanings (see e.g. Heim, 1992; Kratzer, 2006; Sauerland and Yatsushiro, 2017). In this spirit, Sode and Truckenbrodt (2018) suggest that the distribution of German V2 in complement clauses can be captured as outlined in (23).

- (23) V2 in a complement clause requires embedding immediately under a belief-component of the matrix verb.

Thus verbs that allow embedded V2 clauses have plausible decompositions with belief as the lowest meaning component, as shown for the verbs in (1) and (2) in (24).

- (24) a. x believes p  
 b. x asserts p  $\approx$  x expresses that x believes p (see Searle, 1975)  
 c. x dreams p  $\approx$  in x's sleep, x believes p (see Heim, 1998)

Predicates that do not allow embedded V2 either have no belief-component in their meaning, or they have it in such a way that it does not immediately embed the complement clause, as shown in (25) for two of the predicates in (3) – (6). This is pursued in the following.

- (25) a. it is possible that p  
 b. x wants p  $\approx$  x believes that x is better off if p than if not p.  
 (Heim 1992; slightly adapted for space reasons)

#### 2.4. The presupposition of Schlenker (2005) and the interpretation of Fin[i][+bel]

I assume that a finite *that*-clause under the verb *believe* – without verbal mood – has a standard meaning as in (26). I omit temporal specifications throughout. I write  $\text{dox}(\langle m, w \rangle)$  for the set of doxastic alternatives of Mary in world  $w$ , and I refer to  $\langle m, w \rangle$  as their *anchor*.

- (26)  $\llbracket \text{Mary believes that it is raining} \rrbracket^{\text{g,c}} = \lambda w \forall w' [ w' \in \text{dox}(\langle m, w \rangle) \rightarrow \text{rain}(w') ]$

Relative to this, the presupposition that is added by the French indicative in the account of Schlenker (2005) is illustrated in (27). The presupposition is underlined in (27b).



- (27) a.  $\llbracket \text{Mary believes}_i \llbracket \text{that-IND}_i \text{ it is raining} \rrbracket \rrbracket^{\text{g,c}} =$   
 b.  $\lambda w \forall w' [ w' \in \text{dox}(\langle \mathbf{m}, w \rangle) \rightarrow \underline{w'} \in \text{dox}(\langle \mathbf{m}, w \rangle) . \text{rain}(w') ]$

Before addressing the presupposition, I point out the net effect of the coindexing in (27a) for the meaning in (27b). It is highlighted by boldfacing in (27b): the anchor of the matrix verb is identical to the anchor of the embedded indicative.

The underlined presupposition in (27b) now requires that the world  $w'$ , over which the embedded clause is predicated, is an element of the doxastic alternatives at the co-indexed anchor. This presupposition can be taken to be satisfied in (27b), since it is entailed in (27b). Therefore, the French indicative can be used in this sentence.

I will use this presupposition for concreteness here.<sup>8</sup> I interpret  $[i][+\text{bel}]$  in Fin by the syncategorematic rule in (28), which makes use of this presupposition.

- (28)  $\llbracket \text{Fin}[i][+\text{bel}] \rrbracket^{\text{g,c}} = \lambda p \lambda w: \underline{w} \in \text{dox}(g(i)) . p(w)$

For an embedded FinP with the structure in (29a), we thus derive the meaning in (29b).

- (29) a.  $[\text{FinP Fin}[i][+\text{bel}] \text{ it rains}[+\text{bel}]]$   
 b.  $\llbracket [\text{FinP Fin}[i][+\text{bel}] \text{ it rains}[+\text{bel}]] \rrbracket^{\text{g,c}} = \lambda w: \underline{w} \in \text{dox}(g(i)) . \text{rain}(w)$

The presupposition in (28) is logophoric in the sense used here, insofar as it relates to the perspective holder of the clause: the referent of  $[i]$  is  $\langle x, t, w \rangle$  (simplified to  $\langle x, w \rangle$ ), the coordinates of the perspective holder.

### 3. P-relativization

#### 3.1. The syntax of p-relativization

I turn to the issue how such a logophoric index in an embedded clause is formally connected to the perspective holder in the matrix clause. In (27), this was mediated by co-indexing with the matrix verb. However, if we employ such coindexing, as does Schlenker (2005), obstacles arise in cases where the attitude holder is quantified over, such as in *everyone believes p*, as pointed out by Eckardt (2015a).


Another formal way of connecting embedded elements to properties of the matrix verb is employed by Sharvit (2004), Yalcin (2007), Anand and Hacquard (2013), and Eckardt (2015b): these authors make a formal connection via an additional parameter of the interpretation function.

I here develop a different analysis of this connection. It takes inspiration from a suggestion in Heim (2005). She employed an unusual syntactic analysis in which the matrix verb (with its subject argument) originates in the embedded clause and moves out of it, creating a structure

<sup>8</sup> An alternative, closer to Farkas (1985, 1992), Giannakidou (2009), and Truckenbrodt (2006a,b) is:

(i)  $\llbracket \text{Fin}[i][+\text{bel}] \rrbracket^{\text{g,c}} = \lambda p \lambda w: \underline{\text{dox}(g(i))} \subseteq p . p(w)$  (underlined: not pre- but post-supposition here)

in which predicate abstraction relates the embedded clause to the matrix verb. I adapt this as sketched in (30):  $\text{Fin}[i]$  moves to Force within the complement clause. Like movement of a relative pronoun, this creates an operator-variable structure with the index  $[i]$ , to be interpreted by predicate abstraction (Heim and Kratzer, 1998). I call this *p-relativization*, the "p" suggesting "perspective". I further assume that the relative clause structure requires an external head, like standard relative clauses have an NP external head, and that the standard external head of p-relativization is the matrix verb – more specifically its anchor.

- (30) Mary thinks  $\langle x, t, w \rangle$  [<sub>CP</sub> Force Fin  $[i]$  it is raining ]  
  
 movement of  $\text{Fin}[i]$  to Force: *p-relativization*

The adaptation also integrates an element of the suggestions by Kratzer (2006), Moulton (2015), and Elliott (2017). For them, complement clauses are nominal modifiers. In the current adaptation, the complement in (30) similarly has a relative clause structure. However, in (30), this is here only a secondary aspect of the interpretation of the complement clause.

In German V2 clauses, I take p-relativization to be an inherent part of V-to-C movement: the finite verb (carrying  $[+/-\text{bel}][+/-\text{origo}]$  in German) moves to T, then T moves to  $\text{Fin}[i][\pm\text{bel}]$ , then  $\text{Fin}[i][+/-\text{bel}]$  moves to  $\text{Force}[\pm\text{origo}]$ . The interpreted aspects of this are (a) the features  $[\pm\text{bel}]$  in Fin and  $[\pm\text{origo}]$  in Force receive values from the moving finite verb (technically by agree accompanying this movement) and (b) the movement from Fin to Force includes movement of the index  $[i]$ , as shown in (30), and thus p-relativization.

### 3.2. The semantic interpretation of p-relativization

(31) shows the to-be-interpreted essence of a structure in which  $\text{Fin}[i]$  has moved to Force. The moved index is in Force.  $[+/-\text{origo}]$  can be interpreted on the index in Force.  $[i][+/-\text{bel}]$  will still be interpreted in Fin by (28). (Syntactically, I assume that the moved  $\text{Fin}[i][+/-\text{bel}]$  leaves behind a copy (Chomsky, 1993), which is interpreted in its original position.)

- (31) [<sub>ForceP</sub>  $\text{Force}[i][+/-\text{origo}]$  [<sub>FinP</sub>  $\text{Fin}[i][+/-\text{bel}]$  it rains ]]

In parallel to Heim (2005), I interpret the moved structure in terms of predicate abstraction, which is also used for relative pronouns in Heim and Kratzer (1998). I formulate the specific version in (32) for this, which also interprets  $[+/-\text{origo}]$ . The "..." allow for irrelevant syntactic structure due to head movement to Force. I write *context* for the semantic type of context-triples  $\langle x, t, w \rangle$ , here simplified to  $\langle x, w \rangle$ , and I use  $a$  as a semantic variable of this type.

- (32) Predicate abstraction for  $[i][+/-\text{origo}]$

- $\llbracket [ [_{\text{Force}} \dots [+ \text{origo}] \dots [i] \dots ] \text{FinP} ] \rrbracket^{\text{g}, \text{c}}$  is defined if  $\mathbf{g}(i) = \langle \mathbf{c}_{\text{sp}}, \mathbf{c}_{\text{w}} \rangle$ .
- $\llbracket [ [_{\text{Force}} \dots [- \text{origo}] \dots [i] \dots ] \text{FinP} ] \rrbracket^{\text{g}, \text{c}}$  is defined if  $\mathbf{g}(i) \neq \langle \mathbf{c}_{\text{sp}}, \mathbf{c}_{\text{w}} \rangle$ .
- If it is defined, then for all  $\mathbf{g}$  and  $\mathbf{c}$ :  
 $\llbracket [ [_{\text{Force}} \dots [+/-\text{origo}] \dots [i] \dots ] \text{FinP} ] \rrbracket^{\text{g}, \text{c}} = \lambda a \in D_{\text{context}} \llbracket [ \text{FinP} ] \rrbracket^{\mathbf{g}[i \rightarrow a], \text{c}}$

The interpretation of (31) is shown in (33), here putting aside the interpretation of [+/-origo]. In the first step, predicate abstraction creates a lambda abstract over  $a$ , with [i] in the meaning of the FinP mapped to  $a$ . In the second step, Fin[i][+bel] is interpreted, with  $g(i) = a$ .

$$\begin{aligned}
 (33) \quad & \llbracket [\text{ForceP Force[i]} [\text{FinP Fin[i][+bel]} \text{ it rains }]] \rrbracket^{g,c} \\
 & = \lambda a \llbracket [\text{FinP Fin[i]} \text{ it rains }] \rrbracket^{g[i \rightarrow a],c} \quad (\text{by (32)}) \\
 & = \lambda a \lambda w: \underline{w \in \text{dox}(a)} . \text{rain}(w) \quad (\text{with (28)})
 \end{aligned}$$

I turn to the connection between the complement clause (33) and the matrix verb. This complement clause is now both a semantic complement of the matrix verb and a structure with p-relativization. Formally, we can take both into account if we adopt a suggestion of Kaplan (1989:554), which is also pursued in Eckardt (2015a) for the representation of indirect speech. Kaplan suggested that a class of verbs including *say* and *believe* take a character (a function from contexts to propositions) as their complement. Its context argument is what I here call the anchor of the matrix verb (boldfaced in (34)). In (34), I allow this for the verb *believe* as a second meaning option in (34b) in addition to the regular meaning in (34a).

$$\begin{aligned}
 (34) \quad & \text{P-relativization can connect to the matrix verb } \textit{believe} \text{ by option (b)} \\
 & \llbracket \textit{believe} \rrbracket^{g,c} = a. \quad \lambda p_{\langle s,t \rangle} \lambda x \lambda w \forall w' [ w' \in \text{dox}(\langle \mathbf{x}, \mathbf{w} \rangle) \rightarrow p(w') ] \\
 & \quad \text{or} = b. \quad \lambda \phi_{\langle \text{context}, \langle s,t \rangle \rangle} \lambda x \lambda w \forall w' [ w' \in \text{dox}(\langle \mathbf{x}, \mathbf{w} \rangle) \rightarrow \phi(\langle \mathbf{x}, \mathbf{w} \rangle)(w') ] \\
 & \quad \text{whichever fits the semantic type of the complement}
 \end{aligned}$$

(35) shows how (34b) combines with (33) to give the desired result.

$$\begin{aligned}
 (35) \quad & \llbracket \textit{believe} [ \text{Force[i]} \text{ Fin[i][+bel]} \text{ it rains } ] \rrbracket^{g,c} = \\
 & [ \lambda \phi_{\langle \text{context}, \langle s,t \rangle \rangle} \lambda x \lambda w \forall w' [ w' \in \text{dox}(\langle \mathbf{x}, \mathbf{w} \rangle) \rightarrow \phi(\langle \mathbf{x}, \mathbf{w} \rangle)(w') ] ] \\
 & \quad (\lambda a \lambda w'' : \underline{w'' \in \text{dox}(a)} . \text{rain}(w'')) \\
 & = \lambda x \lambda w \forall w' [ w' \in \text{dox}(\langle \mathbf{x}, \mathbf{w} \rangle) \rightarrow \underline{w' \in \text{dox}(\langle \mathbf{x}, \mathbf{w} \rangle)} . \text{rain}(w') ]
 \end{aligned}$$

Let us assume that the verbs *say* and *dream* in (24) also allow such a second meaning for their belief-component and thus allow embedding of a complement with p-relativization.

P-relativization, embedded in the morphosyntactic analysis above, will be a crucial part in the account of the observations in section 1. This is shown in the following section.

#### 4. Application of the account


##### 4.1. The account of the similarities in complement clauses and in declaratives

I assume that French indicative and German V2 both involve p-relativization in their occurrence in complement clauses, as well as in declaratives. For German V2 clauses, this is inherent, as discussed. For the French indicative, I allow p-relativization optionally. To fit this option with the morphosyntactic account above, I formulate (36).

(36) French: Optionally specify  $\text{Fin}[i][+\text{bel}]$  with  $[\text{+origo}]$  or  $[\text{-origo}]$ .


When this option is taken, p-relativization is the consequence.  $\text{Fin}[i][+\text{bel}][\text{+/-origo}]$  will need to move to Force, where its feature  $[\text{+/-origo}]$  can be interpreted (cf. (18) and (33)):

(37) French indicative with p-relativization, triggered by the option in (36):

Force $[i][\text{+/-origo}]$        $\text{Fin}[i][+\text{bel}][\text{+/-origo}]$     Su V $[+\text{bel}]$  ...  


In complement clauses, this works out in both languages as illustrated in (33) and (35).

In declaratives, I invoke the additional assertive element ASS outside of the ForceP. It functions as the external head of p-relativization. I adopt ASS from Truckenbrodt and Sode (in press). They analyze it as a head in the higher speech-act phrase of Krifka (2015).

(38) ASS Force $[i][\text{+/-origo}]$        $\text{Fin}[i][+\text{bel}][\text{+/-origo}]$     ...  


I give a definition of ASS that is sufficient for the purpose at hand in (39). It is similar to the second meaning of *believe* in (34b), but does not take a subject argument and is instead anchored to the speech context. It will pass on its anchor (the speech context) to the perspectival relative clause, and it can satisfy the presupposition of  $\text{Fin}[i][+\text{bel}]$ .

(39)  $[[\text{ASS}]]^{\text{g},c} = \lambda\phi_{\langle \text{context}, \langle s, t \rangle \rangle} \forall w' [ w' \in \text{dox}(\langle \text{c}_{\text{sp}}, \text{c}_{\text{w}} \rangle) \rightarrow \phi(\langle \text{c}_{\text{sp}}, \text{c}_{\text{w}} \rangle)(w') ]$


The semantic combination of ASS with the perspectival relative clause is parallel to (35).

Gutzmann (2015) argues that such grammar-related speech act components should not be construed as at-issue meanings but as use-conditional. I will return to this aspect of ASS.

#### 4.2. The account of the differences in adjunct clauses

For a French restrictive relative clause with indicative like (7), the structure is shown in (40). The relative clause (in the third line) carries its own  $\text{Fin}[i][+\text{bel}]$ . I assume that it uses the same index  $[i]$  as the matrix  $\text{Fin}[i][+\text{bel}]$ .

(40) Binding of  $[i]$  in an embedded clause with French indicative

**Force**  $\text{Fin}[i][+\text{bel}]$  the tourist      comes $[+\text{bel}]$  from Qu.  
 **[Fin[i][+bel]]** to whom I have $[+\text{bel}]$  talked]

Fin-to-Force movement in the matrix clause is interpreted in terms of predicate abstraction as in (32) above. This binds the two occurrences of  $[i]$  in their respective  $\text{Fin}[i][+\text{bel}]$  heads:

(41)  $[[ \text{Force}[i] [_{\text{FinP}} \text{Fin}[i] \dots \text{Fin}[i] \dots ] ]]^{\text{g},c} = \lambda a [[ [_{\text{FinP}} \text{Fin}[i] \dots \text{Fin}[i] \dots ] ]]^{\text{g}[i \rightarrow a],c}$

The meaning of (40) under ASS is then given in (42).

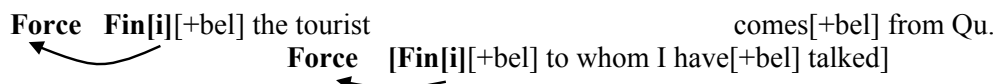
- (42)  $\llbracket \text{ASS Force}[i] \llbracket [i][+\text{bel}] \text{ the tourist } \llbracket [i][+\text{bel}] \text{ to whom I talked} \rrbracket \text{ is from Quebec} \rrbracket \rrbracket^{\text{g.c}}$   
 $= \forall w' [ w' \in \text{dox}(\langle c_{\text{sp}}, c_{\text{w}} \rangle) \rightarrow w' \in \text{dox}(\langle c_{\text{sp}}, c_{\text{w}} \rangle) .$   
 $\text{from}_{w'}(q, \iota \{x \mid \text{tourist}_{w'}(x) \wedge [w' \in \text{dox}(\langle c_{\text{sp}}, c_{\text{w}} \rangle) . \text{talked}_{w'}(c_{\text{sp}}, x)] \} ) ]$

The presupposition of the relative clause is satisfied. Since the relative clause is not separated by an intensional operator from the main clause, the world variable ( $w'$  in (42)) over which the main clause is evaluated is also the world variable over which the relative clause is evaluated. Since, furthermore, the anchors  $[i]$  have identical reference, the presupposition of the relative clause is identical to the presupposition of the main clause. Both are satisfied.

Importantly, the account allows that the presupposition of a French indicative relative clause can be satisfied when the relative clause is in an embedded position. It can be satisfied because  $[i]$  in  $\text{Fin}[i][+\text{bel}]$  can be bound by a higher occurrence of  $p$ -relativization.

This now contrasts in an important way with German V2 clauses. The morphosyntactic underpinnings of the account led us to an analysis in which  $p$ -relativization is an inherent property of German V2 clauses. The structure of a hypothetical embedded V2 relative clause, which we seek to rule out, is shown in (43).

- (43) No binding of  $[i]$  in an embedded clause with German V2



It is true more generally that relative clauses do not allow binding of the relative pronoun or of its trace from outside of the relative clause (apart from the local relation to the external head of the relative clause). Therefore, German V2 clauses cannot have the  $[i]$  in  $\text{Force}[i]$  or  $\text{Fin}[i]$  bound from higher up in the way  $\text{Fin}[i]$  is bound in the third line of (40) in French.

This follows formally in the account of Heim and Kratzer (1998). Given their rule of predicate abstraction (and this carries over to (32), which interprets  $p$ -relativization), an index that is bound by a movement index cannot in addition be bound from higher up. Even if the same index is used for a binding relation higher up, predicate abstraction does not translate such additional co-indexing into a semantic dependency.

We reach similar conclusions if we employ different terms, such as the ones of Chomsky (1981). The index  $[i]$  in  $\text{Fin}[i]$  is in a non-operator position, broadly comparable to  $A$ -positions. After movement to  $\text{Force}$ ,  $[i]$  in  $\text{Force}[i]$  is an operator. As an operator, it cannot be bound. Further, its trace  $[i]$  is plausibly construed as a variable. If it was bound by a higher instance of  $[i]$  in  $\text{Fin}$ , the configuration would be that of a strong crossover violation.

In this way, the account using  $p$ -relativization correctly derives that  $[i]$  in  $\text{Fin}[i]$  in the French indicative can be bound at a distance, while  $[i]$  in  $\text{Fin}[i]$  in German V2 cannot.

I complete the account:  $p$ -relativization requires a local connection to an external head of the perspectival relative clause. Where the V2-clause is a complement clause, such a connection can be made to the matrix verb. In V2 adjunct clauses, this is not an option since they are not

complements of a matrix verb. The only remaining option in the current account is the deployment of ASS as the external head (as a head in a projection above ForceP).

- (44) ASS is required in V2 adjunct clauses as the external head of p-relativization for the anchor in the V2 clause.

The restrictions on V2 adjunct clauses can then be attributed to the presence of ASS:

- (45) a. Clauses headed by ASS are interpreted as assertions.  
 b. Clauses headed by ASS cannot be genuinely embedded.  
 c. If a clause headed by ASS has a host clause, the clause headed by ASS must follow its host clause.

We can relate the property of ASS in (45b), which is particularly relevant here, to the suggestion of Gutzmann (2015): If the clause headed by ASS does not have at-issue content but only use-conditional content, it cannot be embedded in at-issue content.

These results apply to restrictive relatives and embedded adverbial clauses alike.

#### 4.3. Independent evidence for long-distance binding of [i] with the French indicative

In the structure for French in (40), [i] in Fin[i][+bel] in the embedded relative is bound at a distance due to p-relativization in the matrix clause. Independent evidence for this binding at a distance comes from the distribution of verbal mood in relative clauses in indefinite DPs. Examples like (46) have often been discussed in Romance languages since Quine (1956), see e.g. Quer (2001) for Catalan. The verbal mood in the relative clause varies with the reading.

- (46) Nous recherchons un interprète [qui connaît/connaisse le Tamil].  
 We are looking for an interpreter who knows.IND/SBJV Tamil.

If we are looking for a specific interpreter, only indicative is allowed. In this reading, the object scopes over the intensional verb, as in (47). The presupposition of the relative clause (underlined) is satisfied, since the relative clause is evaluated over the same world variable as the main clause. Subjunctive is possible only if the object is in the scope of the intensional verb and we are not assuming that there is an interpreter for Tamil, as in (48). Here the intensional verb shifts the world of evaluation. With the different world variable, the presupposition of the indicative is not satisfied, as shown in (48). Therefore, subjunctive is used. (The scope interaction is due to Quine, 1956; the analysis of *seek* by Montague, 1973 is used; see also Zimmerman, 1992 and Moltmann, 1997 on intensional verbs.)

- (47) a. **ASS Force Fin[i]** [an interpreter [**Fin[i]** who knows Tamil]]  $\lambda_2$  we seek  $t_2$   
 b.  $\forall w [ w \in \text{dox}(\langle c_s, c_w \rangle) \rightarrow \exists x \text{ interpreter}_w(x) \wedge [ \underline{w \in \text{dox}(\langle c_s, c_w \rangle)} . \text{know}_w(x, t)]$   
 $\wedge \text{try}_w(c_s, \lambda w' \text{ find}_{w'}(c_s, x)) ]$



p-relativization (in embedded adjunct clauses). It was seen that this leads to an account of the distribution of indicative vs. subjunctive relative clauses in indefinite DPs by Farkas (1985), and that this account supports the binding analysis.

German verbal mood morphology is additionally specified for [ $\pm$ origo]. In V2-clauses, this triggers movement of the finite verb to Force, where [ $\pm$ origo] is interpreted. The movement takes along [i] from Fin[i]. Therefore p-relativization is an inherent part of German V2-clauses. This eliminates the option that [i] gets a value by being bound. In adjunct V2 clauses, ASS is then required as a local antecedent of p-relativization, restricting the occurrence of adjunct V2-clauses. The account is an argument for the mechanism of p-relativization.

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