Semantic and Syntactic Differences between Finite and Infinitival Complements in German

von

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Zusammenfassung

In dieser Arbeit werden finite und infinite Komplementsätze unter intensionalen und faktiven Prädikaten auf ihre syntaktischen und semantischen Eigenschaften untersucht. Es wird angenommen, dass der grundlegende Unterschied von finiten und infiniten Sätzen darin besteht, wie Tempus und Modus in diesen Sätzen interpretiert werden können: Aus formalen Gründen können nur in finiten Sätzen Tempus und Modus referentiell interpretiert werden. Gebunden interpretiert werden können Tempus und Modus aber gleichermaßen in finiten wie infiniten Sätzen. Dies wird im Zusammenspiel mit den einbettenden Prädikaten relevant. Die neuere Forschung zu Tempus in intensionalen Kontexten zeigt, dass Tempus unter Einstellungen im Regelfall gebunden interpretiert werden muss. In der vorliegenden Arbeit wird beschrieben, wie gebundenes Tempus und gebundener Modus im Deutschen morphoyntaktisch realisiert werden. Dass Tempus und Modus gebunden sein müssen, gilt jedoch nicht nur für die klassischen, doxastischen Einstellungsprädikate, sondern auch für ihre deontischen und zirkumstantiellen Gegenstücke, z. B. *befehlen* und *ermöglichen*, die hier *influence predicates* genannt werden. Anhand dieser Prädikate wird in Analogie zu *de se*-Pronomen gezeigt, wie man eine gebundene Interpretation von Tempus und Modus in finiten Sätzen ableiten kann.

Ein zentraler Beitrag dieser Arbeit liegt in der Behandlung von faktiven Prädikaten. Für Tempus und Modus unter faktiven Prädikaten ist im Gegensatz zu beidem unter Einstellungsprädikaten eine gebundene Lesart ausgeschlossen. Tempus und Modus müssen stattdessen referentiell interpretiert werden. Diese referentielle Interpretation der Zeit- und Weltvariable führt dazu, dass der Komplementsatz ein Ereignis denotiert, welches existentiell gebunden wird. Es wird gezeigt, dass dies auch ontologisch einer adäquaten Beschreibung von Tatsachen-denotierenden Sätzen entspricht. Für den Unterschied von finiten bzw. infiniten Komplementsätzen ergibt

sich, dass faktive Komplemente immer durch finite Komplementsätze ausgedrückt werden müssen, während propositionale Komplemente gleichermaßen als finite und infinite Komplementsätze realisiert werden können. Es wird außerdem gezeigt, dass ein ontologischer Ansatz, der das Verhalten faktiver Sätze in Bezug auf Tempus und Modus als Grundlage nimmt, die relevanten Daten zu Präsuppositionen erklären kann. Tatsachen-denotierende Sätze sind nicht Teil der Assertion und von daher präsupponiert.

Diese semantischen Eigenschaften von intensionalen gegenüber faktiven Komplementen korrelieren mit syntaktischen Eigenschaften der Komplementsätze. Das wesentliche Unterscheidungsmerkmal ist die Intransparenz von faktiven Komplementsätzen für Extraktion. Als Voraussetzung für Transparenz wird hier morphologische (m-) Selektion angenommen. Propositionale CP sind hinsichtlich ihres Tempus unsaturiert und projizieren dies als Merkmal [TENSE] in die C-Domäne. Für dieses Merkmal sind propositionale Prädikate sensitiv, so dass aufgrund von m-Selektion Extraktion erlaubt wird. Da faktive Komplemente aufgrund des referentiellen Tempus saturiert sind, sind sie nicht m-selegiert, was Extraktion ausschließt.

Ein wesentliches Merkmal dieser Arbeit ist, dass die Passung zwischen Prädikattyp und Komplementtyp nicht als starr angesehen wird. Vielmehr gibt es Uminterpretationen von Prädikaten, wenn die Komplemente vom Default-Fall abweichende Merkmale haben. Dies bestätigt die hier vertretenen Annahmen, da die semantische Umdeutung, z. B. von einem faktiven zu einem intensionalen Prädikat, auch syntaktische Konsequenzen hat und umgekehrt syntaktische Effekte regelhafte Wirkungen auf die Interpretation. Dies zeigt, dass es sich in den hier untersuchten Phänomenen (Tempus, Komplementtyp, Extraktion) um für die Komplementation konstitutive Merkmale handelt. Mit dem hier vertretenen Ansatz wird die Präferenz infiniter bzw. finiter Komplementation erklärt und gleichzeitig der Variabilität im Zusammenspiel Rechnung getragen — welcher jedoch die gleichen Regeln zugrundeliegen. Dies ist gleichermaßen beschreibungsadäquat und in der Herangehensweise innovativ.

Abstract

This thesis investigates finite and non-finite complements under intensional and extensional predicates with respect to their syntactic and semantic properties. It is assumed that the fundamental difference between infinitival and finite *dass*-clauses lies in the way tense and mood of the complement are interpreted. For formal reasons, tense and mood can be interpreted indexically only in finite complement clauses. Bound readings of tense and mood are accessible both in finite and non-finite complements. This is crucial when we consider the interplay of complements and their embedding predicates. Recent research on embedded tense and mood shows that tense under attitude predicates has to be receive a bound reading, which is supported in this thesis. The morphosyntactic realization of bound readings is investigated for German data, relying on corpus studies. Furthermore, bound readings of tense and mood are not only attested for attitude predicates but also for their deontic and circumstantial counterparts like *befehlen* 'command' or *ermöglichen* 'enable' which are labeled *influence predicates* here. It is shown for this predicate class how a bound reading of tense under intensional predicates can be derived in analogy to *de se* readings of pronouns. This treatment of variable tense can be applied to mood (subjunctive I and II) as well.

A crucial contribution of this thesis comes from the analysis of factive (extensional) predicates. In contrast to tense under attitudes, a bound reading of tense is excluded under factive predicates. Instead, it is interpreted indexically. This indexical interpretation enables the complement clause to denote an event which is existentially bound. It is shown that this is adequate for fact-denoting arguments also with respect to ontological matters. The difference between finite and non-finite complements thus is an epiphenomenon of a more general difference: factive complements usually have to be expressed by finite clauses while intensional complements can be ex-

pressed both by finite and infinitival complements. Moreover, an ontological approach which builds on the interpretation of tense and mood in extensional contexts copes with the relevant data of presupposition. Fact-denoting arguments are not part of the assertion and are therefore presupposed.

These semantic properties of intensional versus extensional complements correlate with the syntactic properties of the complement clauses. The most important difference is the non-transparency of factive CPs for extraction. Morphological (m-)selection is responsible for transparency. Propositional CPs are unsaturated in the I-domain and thus project a [TENSE] feature into the C-domain. Propositional predicates m-select CPs marked with this feature so that extraction is possible from their complement clauses. Since factive complements are saturated, because tense is interpreted indexically, they are not m-selected and thus disallow extraction.

An essential feature of this thesis is the fact that the fit between predicate class and complement type is not static. Instead, there are many examples of reinterpretations of predicates, which arise whenever the complement type differs from the default. This supports the assumptions of this thesis because the semantic reinterpretation (for instance from a factive into an intensional predicate) has syntactic consequences. This holds vice versa too when syntactic environments (like extraction from a primarily factive complement clause) trigger semantic reinterpretations. This provides evidence for the claim that the phenomena which are considered in this thesis, tense, mood and complement type, are indeed essential for complementation. The approach developed here explains the preference of predicates for finite and/or non-finite complementation and accounts for the variability in the interplay of predicates and their complements — which crucially follows the same rules as default complementation. To take this variability into account makes this approach descriptively adequate and innovative.

Contents

Chapter 1

Introduction

1.1 Syntax, semantics, or both?

For most German control predicates that have sentential argument clauses these sentential arguments can be realized as either finite *dass*-clauses or as infinitival clauses:

(1) Peter verspricht, dass er Maria hilft.

(2) Peter verspricht, Maria zu helfen.

At first sight, there seems to be no meaning difference between the two options. This suggests that infinitival complements are generally substitutes for *dass*-clauses. On the formal side, infinitival complements contrast with finite clauses in that they lack an overt subject and overt morphosyntactic tense and mood.

There are general semantic constraints for both complement types since there are predicates which do not allow for one of the complement types. The first group does not occur with *dass*-clauses:

(3) *Peter traut sich, dass er zu spät kommt.

(4) Peter traut sich, zu spät zu kommen.

There are a few predicates on the other hand which clearly disprefer infinitival complements:

(5) ?Peter ignoriert, sie zu kränken.

(6) Peter ignoriert, dass er sie kränkt.

Complement selection is puzzling: there are two complement types and many control predicates. Besides general dispreferences, most predicates seem to prefer one complement type but this does not entail that they completely disprefer the other. Since there are synonymous uses of infinitival and *dass*-complements, any account of complementation will have to leave space for this considerable variability and flexibility. Indeed, most predicates allow both finite and infinitival complements:

(7) Peter hofft, dass er gewinnt.

(8) Peter hofft zu gewinnen.

In (7) and (8), both options seem to be equivalent. This raises theoretical questions: Does this mean that German has two types of sentential arguments which are simply coexisting variants? Is it true that two forms coexist without diverging in meaning?

I will follow a compositional track which means that I assume that a form-function fit between syntax, semantics and pragmatics is desirable and possible. From a compositional point of view, it is very unlikely that both are equivalent semantically since the formal features differ. The sentential argument in (7a) is finite; it has inflectional morphology on the verb, which marks it for present, indicative, third person singular and there is an overt subject which agrees with the verb. Furthermore, there is a complementizer *dass*. The sentential argument in (7b) lacks all these properties. From this point of view, it is noteworthy if they are synonymous.

There is a group of predicates where the complement type matters:

(9) Peter vergisst, einen Fehler zu machen.

(10) Peter vergisst, dass er einen Fehler macht.

(9) expresses that Peter had the intention to make a mistake but does succeed not in doing it. (10) means that he is making a mistake but forgets about this fact. This is the most prominent meaning difference between finite and infinitival complements. It would be easy to assume two different lexical entries of *vergessen* but we will see that this is a structural effect which holds for a whole subclass of predicates.

German grammars like Zifonun et al. (1997) point out that a finite *dass*-clause can only be changed to an infinitival clause if the subject of the complement clause is coreferent with an antecendent in the matrix clause

(depending on the predicate's control properties) or if there is arbitrary control:

(11) a. Wir hoffen, dass *wir* bald gehen können.

b. Wir_i hoffen, PRO_i bald gehen zu können.

(12) a. In einem solchen Fall empfehlen wir, dass man sofort einen Arzt aufsucht.

b. In einem solchen Fall empfehlen wir, PRO_{arb} sofort einen Arzt aufzusuchen.

[Zifonun et al. (1997), 1449 (2)]

In some cases, the control properties of a predicate exclude infinitival complements since the *Orientierungsunverträglichkeit* (mismatch of orientation) excludes an infinitival complement. Zifonun et al. (1997) mention *bedingen* 'determine', *damit zusammenhängen* 'be linked up' and *daran liegen* 'be due to'.

With respect to the difference between *dass*-clause and infinitival clause, Zifonun et al. (1997) state that generally, infinitival complement clauses are substitutes for *dass*- and *wenn*-complements (not for *ob*-clauses). They occur under propositional, cognitive and emotive factive predicates. According to Zifonun et al. (1997), with factives, infinitival complements seem to lose their presupposition and are interpreted like *wenn*-clauses.[1]

There have been only few accounts to describe the pragmatic-stylistic differences of *dass*- and infinitival complements explicit. In these studies, *dass*-clauses are associated with 'objectivity' or it is stated that they are more 'fixed' than infinitival complements. Infinitival complements, on the other hand are claimed to be more 'personal', 'subjective' and 'prospective' (cf. Noel, 2003, Rudanko, 1984). I will show that this view cannot be maintained because it is too general and confuses essential properties with epiphenomena. Instead, I will show that the formal differences are triggered

[1] Zifonun et al. (1997), 1468 (29):

> Ersetzt die IK [Infinitivkonstruktion] einen Komplementsatz bei faktiven Verben, so kann die IK — als Bezeichnung eines latenten Sachverhalts — sowohl im Sinne eines *daß*-Satzes (+ wahr) als auch im Sinne eines *wenn*-Satzes (- wahr) gebraucht werden:
>
> (i) Er wird (es) sicher bedauern, dich zu verletzen.

I agree with this view, see section 5.2.

by semantic differences.

Grimshaw (1979) is a good starting point for this thesis: She disapproves of the — at that time — traditionally accepted view of Chomsky (1973) and Bresnan (1972) according to which the selectional requirements of predicates concerned only the syntactic, i. e. categorial properties of a complement. She summarizes the prerequisites of such a view in two assumptions (p. 279):

(i) Complements of the same syntactic form will be selected by the same predicates.

(ii) Complements of distinct syntactic form may be selected by distinct (though not necessarily disjoint) sets of predicates.

With her observations on exclamatory and interrogative complements, Grimshaw develops a view which separates subcategorization (i. e. selection for the categorial properties) and selection, which must be met at the level of semantic representation:

> 'Predicates do not select for complements of a particular syntactic form, but rather for complements of a particular semantic type. Thus, for a predicate-complement combination to be well-formed, two criteria must be satisfied. The complement must belong to a syntactic category for which the predicate is subcategorized, and it must belong to a semantic type which the predicate selects. [...]
>
> (i) Complements of the same semantic type will be selected by the same predicates.
>
> (ii) Complements of different semantic types may be selected by different (though not necessarily disjoint) sets of predicates.
>
> [Grimshaw (1979), p. 280]

Can we predict which predicate will subcategorize for which category and which predicate selects for which semantic complement type? Grimshaw is sure that the answer to this question must be found in the semantic domain. It is tempting to reduce subcategorization to selection. However, Grimshaw doubts that this is possible. She concludes:

> Thus, for a predicate-complement pair to be well-formed, three conditions must be satisfied. The predicate and its complement must be semantically compatible; the complement must meet the idiosyncratic selection conditions encoded in the semantic frame of the predicate; and the complement must meet the (also idiosyncratic) syntactic conditions encoded in the subcategorization frame of the predicates. [Grimshaw (1979), p. 325]

I entirely agree with the first and second requirement. The basis for her decision to still refer to subcategorization is a contrast like this:

(13) a. John informed me that he was leaving for Paris.

b. John told me that he was leaving for Paris.

a. *John informed me what he had been doing.

b. John told me what he had been doing.

Although *tell* and *inform* are semantically very similar, still they do not share the subcategorizational requirements. I will not speculate here what the reasons for these differences may be. As for German, there is no problem:

(14) a. John informierte mich (darüber), was er gemacht hatte.

b. John sagte mir, was er gemacht hatte.

Maybe (14) in German is better with the correlative *darüber*. It is not ungrammatical without it, though. In this thesis, I will defend the idea that the restrictions for complementation lie in the semantic area only. What we need in order to reduce subcategorization to selection is a clear understanding of which semantic complement types a clausal complement may express. Hence, we will have to do two things: first, figure out whether there are clear-cut semantic predicate classes, for instance in the style of Karttunen (1971b). Second, we will have to see whether we can predict the distribution of finite/non-finite complements from the semantics of the predicates and the complements' denotations. The complementation patterns should fall out naturally if this view can be maintained.

1.2 Outline

This thesis is compsed of three major parts. Part I addresses the semantics of complement clauses. In chapter 2, *intensional predicates* will be addressed: The crucial notions of this thesis come from tense and mood, which will be treated as variables. I will introduce these concepts after an introduction, in sections 2.2.1 (person), 2.2.2 (tense) and 2.2.3 (mood). Following, I will argue in section 2.3 that *influence predicates* like *zwingen* 'force' can be treated in a way very similar to attitudes. We will see that the former involve epistemic quantification while the latter involve root circumstantial quantification. Factives, on the other hand, are very different: chapter 3 therefore presents the properties of these *extensional predicates*. After an overview in 3.1, section 3.2 addresses their behavior with respect to tense and mood. I will give an account of how to treat factive complements ontologically in section 3.3 and give a formal semantic approach to the semantics of factive complementation. In section 3.4, I will present how their presuppositional character can be captured without reference to the notion of common ground.

Part II addresses the syntactic properties of infinitival and finite complements. Section 4.1 verifies that propositional complements are generated in the canonical argument positions and are 'detectable' due to a feature [TENSE] in their I/C-domain. It will be argued in section 4.2 that factives are not m-selected and, as a consequence, are not transparent for extraction. I address infinitival propositional and implicative complements in section 4.3. Since it will be argued that some complements are not necessarily generated as sisters of V^0, we will need a mechanism of non-structural θ-role assignment (see section 4.4), which I will borrow from a mechanism known from V2-complements. I will show how this non-structural θ-role assignment works in the case of factive/propositional complements.

Part III shows that there is an interplay between the three complementation strategies presented up to this point. I will introduce the concept of class shifting which is triggered by finite/infinitival complementation and other factors. There are predicates which are usually propositional or implicative but which may behave like factives in particular linguistic environments (section 5.1). On the other hand, there are factive predicates which can be coerced into non-factive readings (section 5.2). In section 5.3, I will address a group of predicates which are factive with a finite complement and im-

plicative with an infinitival complement and show how these readings arise compositionally. Thes results will be summarized in section 5.3.2.

1.3 Hypotheses

The major aim of this thesis is to investigate the conditions under which finite and infinitival complements occur and what requirements propositional and factive complements have to meet. I assume that finite and infinitival complements differ in the range of their formal properties. Hence, instead of finding correlations between finite/non-finite complements and predicate classes, it is crucial to investigate what the essential semantic requirements of a complement are.

In this thesis, I will address two major predicate classes, both subordinate clausal complements.

Predicate class	Binding relation	semantic subordination
Intensional	binding of tense/mood	propositional
Extensional	no binding of tense/mood	eventive/fact-denoting

Intensional predicates comprise all predicates which involve quantification over sets of worlds (propositions). The modal base for the quantification depends on the matrix predicate: attitudes in the sense of Hintikka (1971) involve epistemic modal bases, influence predicates involve quantification with a deontic or circumstantial modal base. Note that this is a wide notion of *intensional predicates* which comprises not only attitudes but all predicates which bind the time and world variable of their complement. Extensional predicates select for single situations. We will see that this predicate class corresponds to what is known as factive predicates. Consequently, with intensional complements, the time and world variable of the complement is bound, while extensional predicates do not provide lexical binders for tense and mood of their complements. We will see that this has consequences for the interpretation of tense and mood in the complements of both predicate classes.

What does this have to do with the distinction between finite and non-finite complements? I will show that the interpretatory range of finite and infinitival complements differs. The crucial factor is whether the complement has a zero tense/mood variable or not. Finite clauses may be zero

tense/mood, but mood and tense in finite clauses may also be indexical ('deictic'). Infinitival complements contain zero tense/mood variables. I will show that this difference is responsible for the fact that infinitival complements are suitable complements of intensional predicates but not for (most) factive predicates.

I assume that this temporal/modal make-up projects into the syntax affecting their s-selection. Intensional complements are morphologically selected while extensional complements are not. This has effects on their syntactic properties. The non-transparency of factive complements for extraction follows from their not being m-selected. I will show that complements of factive and implicative predicates do not have to be generated in the canonical argument position.

Complementation is compositional in a sense that predicates are compatible with different complement types. This holds for semantic complement types (propositions and facts) but also for formal complement types (in this case, infinitival and finite complement clauses). Intensional predicates s-select propositions and as a consequence m-select clauses marked with the feature [TENSE]. Factive and implicative predicates s-select situations or events and do not m-select their complements. They are more liberal with respect to the category of their complement.

I assume that the predicate classes of intensional and extensional predicates are abstract classes which have prototypical representatives, like *glauben* 'believe' for intensional predicates. I will assume that many other predicates share crucial semantic and syntactic properties with these prototypical predicates. But embedding predicates may change classes, and there may even be a flexible transition between the predicate classes. This is not detrimental to the assumptions in this thesis — quite the contrary because this flexibility falls out when assuming abstract predicate classes instead of predicate lists.

It is also possible for some (concrete) predicates to be members of more than one predicate class. This does not weaken my claim: it is crucial that, besides others (like implicative complementation), there are these two relationships between matrix and embedded events which each correlate with certain syntactic and semantic implications. This is the default relation for a predicate-complement complex. These relationships are abstract while a particular predicate may be an instantiation of more than one complementation type. Novel in this dissertation is that I investigate the non-default

relations as well: There are factive readings of complements under intensional predicates and there are non-factive readings under factive predicates. We can trigger these readings when we know how form and function work together. If we trigger an indexical reading of mood under a propositional predicate, we can coerce the complement into a factive reading. If under a factive predicate we inhibit an indexical reading of mood and tense, we will get a non-factive reading. First, we have to see what the default relations are. The default relations will be addressed in chapters 2 through 4. Chapter 5 shows in detail how class shifting can be triggered.

Hence, the aim in this thesis is not to give an exhaustive list of intensional or extensional predicates but to support these hypotheses: First, there is a bundle of syntax and semantic properties which is shared by members of each predicate class. Second, these properties can be accounted for in a compositional manner. Third, although the properties of members of the (abstract) predicate classes are sharp-cut, this is not the case for the concrete predicates. The advantage of this approach lies in the fact that the built-in flexibility can account for the interpretation of concrete predicates in their contexts.

Part I

Semantics of intensional and extensional predicates

Chapter 2

Intensional predicates

2.1 Overview

The class of intensional predicates comprises all predicates which involve modal quantification in the tradition of Hintikka (1971). Thus, the prototypical examples are predicates of the *believe*-type which involve quantification over epistemic (belief) worlds, i. e. *glauben* 'believe', *denken* 'think', *meinen* 'suppose', *vermuten* 'assume', *befürchten* 'be afraid'. I will concentrate on *glauben* 'believe' and *erwarten* 'expect' here, claiming that they are core member of the class of epistemic intensional predicates.

Modal operators select for intensions. A standard attitude like *believe* in (15) selects for an object of type <st>:

(15) Peter glaubt, dass die Erde rund ist.

As will be shown here, the attitude predicate binds the world variable of its complement which will then denote the belief worlds of Peter. A believe statement is true if in every doxastic alternative w' of the holder, the proposition holds.

(16) Peter glaubt, dass die Erde eine Scheibe ist.

(17) For all of Peter's doxastic alternatives $<w'>$ in w_0: $[\lambda w'$. the earth is flat in $w'](w) = 1$.

Additionally, we will see that the tense variable is bound as well in a way such that the present tense in (15) denotes the holder's subjective now. The modal operator may also specify the world and time variables. For time, a

good example is *erwarten* 'expect'. I will address future-oriented predicates in section 2.2.2.

Additionally, the class of intensional predicates includes what I label *influence predicates* like *zwingen* 'force', *ermöglichen* 'enable', *befehlen* 'command', *erlauben* 'allow'. At first sight, these predicates do not seem to have much in common with the *believe*-type predicates. Their common property is that they are quantifiers over similar semantic types. Both select for intensionalized properties of times. The difference between attitudes and influence predicates lies in the modal base for quantification (in a framework of Kratzer 1978) which is carried along by the embedding predicate: If the modal base is epistemic, the predicate is an attitude as in (18). If the modal base is deontic or circumstantial, the predicate is an influence predicate expressing some kind of influence by the agent and on a patient, see (19) and (20).

(18) Peter glaubt, dass Anna glücklich ist. (epistemic modal base)

(19) Peter befiehlt Anna, dass sie glücklich ist. (deontic modal base)

(20) Peter bringt Anna dazu, dass sie glücklich ist. (circumstantial modal base)

I will argue that, as the lexical semantics of the control predicates involves quantification over propositions, tense and mood must not be interpreted indexically within these complements. I will show that there are zero moods and tenses which allow for propositions to be quantified over.

Only predicates which satisfy the definition given above will be considered here. In the literature, however, very often more predicates are included. Portner (1992) subsumes more predicates under attitudes than I do here. But as their behavior with respect to mood and tense is very different from intensional predicates, verbs like *regret, enjoy* will be treated as extensional predicates in chapter 3. The terminology 'extensional' and 'intensional' as used in this thesis is borrowed from Groenendijk & Stokhof (1984). They call predicates like *ask* intensional while *find out* is extensional. It will become clear that this corresponds to the formal and ontological properties of the complements of both predicate classes.

2.2 Attitudes

In this section, I will give a brief overview over the most important phenomena of person and tense in intensional contexts. We will see that tense in intensional contexts can be captured best if we assume that tense behaves as a variable, similar to pronouns. The sections on tense are based on the recent literature on variable tense as elaborated i. a. for English tense by von Stechow (1995), Ogihara (1996), Abusch (1997), Kratzer (1998) following Partee (1973). In their approach, tense can be treated like a variable — similar to pronouns. Since the issue relies on the treatment of pronouns as variables, I will address person first.

2.2.1 Binding of person

Pronouns can be treated as variables. There are indexical, variable and bound pronouns as illustrated in (21) to (23):

(21) Peter glaubt, dass ich$_i$ zu spät kommen werde. (indexical)

(22) Peter$_i$ denkt über Frank$_k$ nach. Er$_i$ glaubt, dass er$_k$ zu spät kommen wird. (variable, ±coindexed)

(23) [Nur Peter]$_i$ glaubt man ohne Zweifel, dass er$_i$ pünktlich sein wird. (bound)

I will follow Kratzer (1998) in her treatment of pronouns. This is based on the assumption that there are indexical pronouns (*I, you, we*), variable pronouns (*he$_i$, she$_i$, it$_i$, they$_i$*) and a zero pronoun. In contrast with third person pronouns, zero pronouns lack presuppositions with respect to gender and person. Zero pronouns can be pronounced, and they are pronounced with the ϕ-features they inherit from their antecedent. (25) is taken from Kratzer (1998):

(24) Only I got a question that I understood.

(25) [Only I]$_1$ got a question that $\emptyset_1$ understood. (zero pronoun, sloppy reading)

(26) [Only I]$_1$ got a question that I understood. (indexical pronoun, strict reading)

The zero-pronoun inherits its features from its antecedent and is spelled out as 'I'. Since 'I' is a zero pronoun at LF, we get a sloppy reading. If 'I'

is interpreted indexically, we do not get a sloppy reading but only a strict reading. Both readings are available in (24) since the 'I' at PF is ambiguous between an indexical pronoun and a zero pronoun. It is only from the sloppy reading that we can tell that there is a reading with a zero pronoun which is featureless at LF. I will give one more example from Kratzer (1998) which illustrates this difference between zero pronouns and indexical pronouns.

(27) He$_1$ left.

(28) Who$_1$ thinks he$_1$ is God?

The pronoun in (27) is a variable which receives its index via the assignment function. In any case, it carries the presupposition that it refers to a male person. In (28), however, this is different. *He* does not necessarily refer to a male person. It seems as if in English, *he* is the PF version of a zero pronoun in environments where it has to be spelled out (i. e. the spelled out version of PRO, so to speak).

There are locality conditions for bound variables, i. e. there must not be an intervening clause between the antecedent and the zero pronoun:

(29) They only asked ME whether you thought I could answer the question. (no sloppy reading)

[=Kratzer (1998), (14)]

In infinitival clauses, we always have the zero pronoun, PRO, while in finite clauses, we have a pronoun which is ambiguous between the zero and the indexical pronoun. Hence, the infinitival complement only has the sloppy reading while a finite clause has both the strict reading and the sloppy reading. This will be important for the difference between *de se* and *de re* readings in the following section with respect to person, and when transferred to tense, will have crucial impact on the interpretative differences of finite and infinitival complements.

De se readings

In intensional environments, an embedded pronoun can have different readings. I will address only the difference between *de se/de re* in non-transparent contexts.

(30) Peter$_i$ glaubt, dass er$_{i,j}$ reich ist.

The first reading is what we get when *er* is identified with Peter's self, i. e. when Peter has a belief about himself. Secondly, Peter may have a belief about someone else, for instance Paul_j. Usually, Peter will not have a belief about the individual *Paul* but about his concept(s) of the individual Paul — counterpart relations in the sense of Lewis (1979) will assure that usually, he will still refer to the individual Paul. This means that among his individual concepts, he may have concepts about other individuals, and he may have beliefs about himself. A *de se* belief is a belief about oneself. A *de re* belief is a belief of individual concepts.

In certain situations, it may happen that the holder has an attitude towards someone (i. e. not about himself) who happens to be himself. In these cases, we have to distinguish between *de se* and *de re*.

For illustration, let us have a look at a classic example scenario: John is so drunk that he does not recognize himself on TV in a canvass show. He has a belief about the man on TV — in one case he recognizes himself, in the other he doesn't.

(31) John hopes that he will be elected.

a. 'I hope that he is elected' (de re)

b. 'I hope that I am elected' (de se)

(32) John hopes to be elected.

a. *'I hope that he is elected' (*de re)

b. 'I hope that I am elected' (de se)

[= Schlenker (2004), (9a+b)]

Either John's hope is (a) or (b). In both readings, the pronoun refers to John, but in the *de se* reading, John has a hope about himself, while in the *de re* reading his hope is about someone who happens to be him.

Note that there is a difference between infinitival and finite complements: The pronoun *he* in the finite complement clause in (31) has both the *de re* and *de se* reading while the infinitival complement in (32) only has a *de se* reading. (I ignore cases of arbitrary and control shift here.) Chierchia (1990) notices that the infinitival subject PRO generally only has a *de se* reading. *Hope* in (31) is a relation between John and the set of doubles (ignoring tense) of the form <x,w> so that x x is elected in w. So, contrary to the ambiguous (at PF) pronoun *he*, PRO obligatorily has to be coindexed with x in the triple:

(33) *John hopes to*$_{<\mathrm{x}_i \mathrm{w}_k>}$ *PRO*$_{\mathrm{x}_i}$ *be-elected*-t_j-w_k is true iff for every triple <x,w> compatible with John's hope, x is elected in w.
[= Schlenker (2004), ignoring tense, (12)b]

In (34), *himself* provides evidence that PRO inherits the features of *John*.

(34) John hopes PRO_i to buy $\mathrm{himself}_i$ a car. [= Schlenker (2004), (15)]

Thus, I assume that *de se* readings come 'for free' in infinitival complements. The complement clause including PRO denotes an intensionalized property of individuals which unavoidably leads to a *de se* reading.

But how can we derive the *de se/de re* distinction in finite complements? Do finite *de se* complements denote properties of individuals as well? At first sight, it seems reasonable to assume that the *de re* reading is what we get when we interpret *he* as a free variable which is coindexed with John and the *de se* reading is what we get when we interpret it as a zero pronoun.

Note that, as Schlenker points out, quantification examples show that the *de re* reading is not due to accidental reference but that the pronoun is indeed bound.

(35) Everybody hopes that he will be elected.

(36) Jeder Kandidat glaubt, dass er gewählt wird, erkennt sich aber nicht.

The embedded *he* is bound by the quantifier, and still it has both readings.

Hence, it is not enough to trace the differences back only to scope differences. It means that we need a more explicit differentiation. I will assume two basic pronoun interpretation types for intransparent interpretation.

- *de re*: referring to an individual concept (not to an individual). This individual concept is aquaintance-based — holders may have concepts about every individual. Linguistically, the description is seen through 'the holder's eyes'.

- *de se*: referring to the holder's self. The holder has a belief about the individual which is him *and* he/she knows that it is a belief about him/herself. It will be specified how this reading arises and how it can be derived.

How can the *de se* reading be derived in finite clauses? Percus & Sauerland (2003a) address the differences between *de se* and *de re* readings under attitudes in detail.

Basing on a Lewisian account, on their approach, attitudes express existential quantification over acquaintance relations. An expression like (37)

(37) thinks that he will win the election

[= Percus & Sauerland (2003a), (9)]

has three readings. First, there is a *de se* reading. The truth conditions are given in (38). Second, it has a *non-de se* reading where the *res* happens to be the holder (cf. (39)). In the third reading, the *res* can be identified with someone else (cf. (40)).

(38) $[\![\text{LF(37)-de-se}]\!]_g$ = λx. λw. For all <y,w'> in $\text{DOX}_{x,w}$, y wins the election in w'

(39) $[\![\text{LF(37)-de-re}]\!]_g$ = λx. there is some acquaintance relation R that x bears uniquely to **x** in g(0), such that,
for all <y,w'> in $\text{DOX}_{x,g(0)}$, the individual that y bears R to in w' wins the election in w'.

(40) $[\![\text{LF(37)-de-re}]\!]_g$ = λx. there is some acquaintance relation R that x bears uniquely to **g(i)** in g(0), such that,
for all <y,w'> in $\text{DOX}_{x,g(0)}$, the individual that y bears R to in w' wins the election in w'.

[= Percus & Sauerland (2003a), (10); 15a, 15b]

Percus & Sauerland (2003a) prove that the pronoun *he* really has a proper *de se* reading.

I will briefly sketch their argument here. They present a scenario where John thinks 'I will win' but does not recognize himself on TV. There are two other candidates thinking 'I will lose' but thinking that the candidates which happen to be themselves will win (but they do not recognize themselves on TV). Now the authors examine who satisfies the predicate in (41) under a *de se* reading.

(41) Only John thinks that he will win the election.

In the scenario presented, John is not the only individual who satisfies (39), since the other two candidates also satisfy (39). John satisfies the predicate (40), but he is not the only individual who satisfies it if our scenario includes a fourth candidate who thinks that the candidate who happens to be John will win. Note that everyone satisfying the genuine *de se* predicate in (38) also satisfies the predicate in (39) because the identity relation is

an acquaintance relation. The opposite case is more restricted: in the finite clause, John is the only one satisfying the genuine (38) LF, but there are others satisfying the *de re* reading in (39). We know that the finite clause has a proper *de se* reading. John is the only one satisfying the *de se* reading given in (38). The two other candidates do not satisfy it nor does the third.

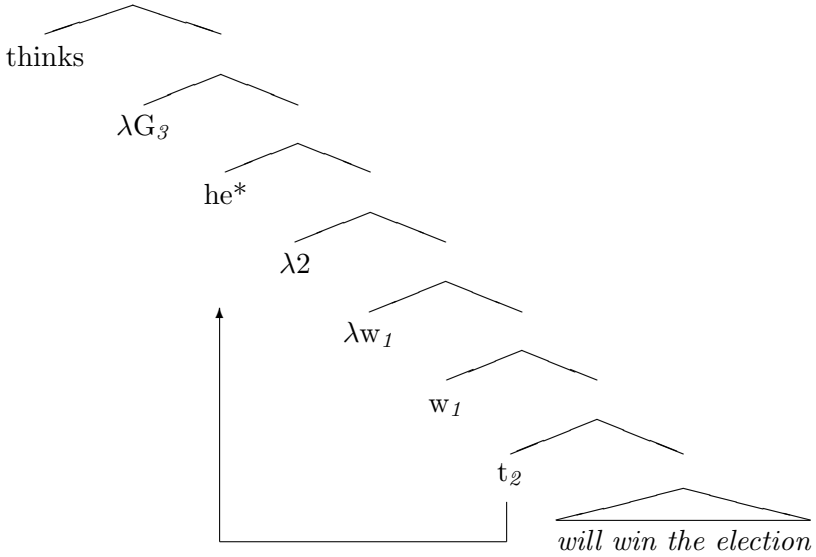
This means that there is a way to derive the proper *de se* reading not only with an infinitival complement but also with a finite complement (implying that the subject is expressed by a pronoun). This insight is crucial for this thesis: Besides a *de re* reading, *he* has a proper *de se* reading.

Generally, it is assumed that the *de se* reading is accessible when the complement denotes a property of individuals, i. e. when — on Lewis' account — a holder self-ascribes the property of winning the election. On the surface, there is an overt pronoun in the finite clause. Does this mean that this pronoun is a zero pronoun? How do we know?

On an abstract level, the idea of Sauerland & Percus involves a movement approach claiming that there is an extra argument which is filled via acquaintance relations. It is a position which is in some way embedded under the attitude.[1] To believe that Mary is happy means that the holder has a belief about something he considers to be Mary (via his acquaintance relations). How are this object and the 'belief content' connected? Why can a finite pronoun express *de se* readings? In their approach, in a *de se* reading of a finite sentence with an overt pronoun like (41), the pronoun *he* behaves like a relative pronoun. This means that it can move, and doing so it leaves a lambda and a trace (an individual variable which is bound by the lambda). The relative pronoun *he* moves to the edge of the complement, the rest of the complement now denotes a property. (G: concept generator)

[1] Percus & Sauerland (2003a) put acquaintance relations on a more abstract level and call them concept-generators. The intuition is that depending on the lexical semantics of the attitude, the possible concepts may differ. See their paper for details.

(42) [= Percus & Sauerland (2003a), (24)]



*He** (the '*' indicates that it is the relative pronoun *he*) is moved to the position below the concept generator and leaves trace t_2.

The lexical entry of an attitude like *believe* now takes two arguments, a concept generator (which takes something one may bear a certain acquaintance relation to) and a property of individuals. A concept-generator gives us the individual concept for every individual.

(43) G is a concept-generator for individual x in w iff

i. G is a function from individuals to individual concepts

ii. Dom(G) = z: x is acquainted with z in w

In the case of *de se* readings, the first argument is identified with the holder's self, i. e. he self-ascribes a property, for example to love Mary:

(44) John believes that he loves Mary.

(45) John believes (about himself) $\lambda 2$ t_2 loves Mary.

Percus & Sauerland (2003a) manage to prove that there is a proper *de se* reading of finite complement clauses. When we refer to zero pronouns bound by the binder index of the attitude, we can derive the *de se* reading as well via movement to the edge of the clause. The *de re* pronoun is moved to the edge of the clause, and the remainder of the clause denotes a property of individuals. In my eyes, the crucial point lies in the fact that in

the acquaintance relations, the holder can distinguish between himself and other individuals. Using the idea of a concept, we have access to the holder's linking between individual concepts and himself.

Taking these considerations as a starting point, I assume that there is always an implicit *concept* argument in attitudes. The *concept* is the place where we can locate the lexical and control properties of control predicates.

The concept contains two types of information. First, it tells us what the default-relation is, this is the control relation. Second, it gives us the range of possibilities accessible at this position. For *believe*, the default relation is a belief about oneself. Accessible are all individual concepts the holder is aquainted with.

Generally, a belief is always a belief about a concept, a property is ascribed to this *concept*. If the holder has acquaintance-based relations to other persons, the default may be overridden by other licit individual concepts. At first sight, there seem to be no restrictions provided by the idiosyncratic properties of *believe*. Yet, there are restrictions as the concept-generators differ depending on the predicate. Here is an example taken from Percus & Sauerland (2003a):

> Suppose Mary anonymously reviewed John's paper (unknown to John). We would then take the sentence *John thought that Mary was a bald man in his 90's* to be true in a situation in which John thought that his article had been reviewed by a bald man in his 90's. However, we would not take the sentence *John dreamed that Mary was a bald man in his 90's* to be true in a situation in which John dreamed that his article had been reviewed by a bald man in his 90's. One might conclude from this that, while both belief reports and dream reports quantify over concept-generators, they quantify over different kinds of concept-generators. The 'belief-relevant' concept-generators can yield concepts that pick out anonymous reviewers but the 'dream-relevant' concept-generators cannot.

Percus & Sauerland (2003b) investigate restrictions on the denotation of pronouns under *dream*. These predicates allow shifting the holder to a dream-self for instance when we imagine we are someone else. (Complications arise when we imagine we are someone else and in our imagination world we 'meet' the one we know we are in 'real' life. This is their major

concern in that paper.)

We can now derive *de se* readings from overt pronouns and we have implemented a concept position which turns individual variables into individual concepts. Recall that this was necessary only for finite complements.

This is an important difference between finite and infinitival clauses: infinitival clauses only have a *de se* reading while finite clauses have both. Infinitival complements denote properties of individuals (as they contain a zero pronoun, PRO), so that they can be combined with the attitude and its concept directly. It relates the default-concept and a property, in the case of attitudes, this corresponds to self-ascription of this property.[2]

I have described the derivation of Percus & Sauerland (2003a) who derive a semantic object of type <e,t> by moving the pronoun in finite clauses, similar to a relative pronoun. This mechanism is necessary to derive a proper *de se* reading from a pronoun like *he*. It is not a zero pronoun to begin with, but via LF-movement, the complement may denote a property of individuals which can be combined with the holder's self-concept. I call this *derived de se* because we need to invoke a movement account in order to derive the right semantic type.

The following section will address tense. We will see that tense can be treated in analogy to pronouns and that the mechanisms which we used for *de se* pronouns are fruitful for tense as well.

2.2.2 Binding of tense

Traditionally, tense is analyzed as deictic, at least in its primary meaning (*Primärbedeutung,* Vater, 1994). The most influential approach is the one of Reichenbach (1947). It is based on three notions: point of the event (E), point of reference (R) and point of speech (S). For illustration, past perfect has the structure E – R – S which means that the reference point is situated before the speech time and the event situation before the reference point. In the simple present, all three fall together in the structure S – R – E. (see below for an example). Although used widely today, there are serious

[2]Object raising constructions which exist in English are ignored here:

(i) Peter believes her to be pregnant.

It seems possible to override the default-individual concept with infinitives as well.

objections, especially for intensional contexts. I will use a variable tense approach instead. In this thesis, I describe the facts and give a formal analysis for tense in complement clauses of intensional (and extensional) predicates in German. I am not aiming at an exhaustive descriptive approach for German tense. For descriptive approaches to the German tense system see for instance Klein (1994), Ehrich (1992), Vater (1994).

Intensional contexts (English)

Von Stechow (1995), Ogihara (1996), Abusch (1997), Kratzer (1998) and many more follow the basic idea of Partee (1973) that tenses behave like pronouns. They denote a closed temporal interval. Independent from the formal implementation, we have to distinguish between interpreted tenses and uninterpreted tenses. The basic observation is that under attitudes, tense is not interpreted but only a feature-less variable (i. e. lacking presuppositions).

The traditional Reichenbachian approach leads to incorrect results. Tense in intensional contexts cannot be interpreted as indexical tense. This can be shown by two simple examples (taken from von Stechow, 1995, for more counterexamples see his paper).

(46) Zuzana thinks that Vashek is asleep. [= von Stechow (1995) (1-15)]

In a Reichenbachian approach, (46) is analyzed with two event times E_1 (the time of the thinking) and E_2 (the time of Vashek's being asleep). The simultaneous reading makes $E_1 = E_2$. Von Stechow argues that this is not the case. Imagine the attitude holder Zuzana thinks it is 6 o'clock, but in fact, it is 5 o'clock. Then her belief is 'Vashek is asleep (and it is 6 o'clock)'. The time of the sleeping would be 6 o'clock while the event time of her thinking E_1 is 5 o'clock. More generally, the attitude holder does not care about the time and simply thinks: 'Vashek is asleep now'. Her belief content can be paraphrased as 'being at a time at which Vashek is asleep' — the belief does not make a statement about E_1, the time of thinking. The same point can be made in past-under-past sentences. Stechow concludes that there is 'no relation between the time in the belief world and the time of the believing' (p. 5).

His formalization accounts for this independence of the time within the belief from the time of believing:

(47) Zuzana thought that Vashek was asleep.

(48) $\exists\, t_1\ [t_1 < t_0 \wedge \mathit{think}_{w_0 t_1}\ (\mathit{Zuzana},\ \lambda t_0\ \lambda w_0\ [\mathit{asleep}_{w_0 t_1}\ (\text{Vashek})])]$
[= von Stechow (1995) (1-16), (2-1)]

In the embedded clause, there is no past tense in the representation in (48) because the time and world variable are 'abstracted away' via λ-binding. This makes sure that there is no connection between believed and believing time. Formalized in this way, the attitude predicate has to be a universal quantifier which quantifies over world-time pairs. In von Stechow (1995), *to believe* means that the attitude holder situates himself in a world at a time such that P is true in that world at that time. Hence, the meaning of *think* according to Stechow (1995:6) is:

(49) $[\![\text{think}]\!](P)(a)(t)(w) = 1$ iff for every w' and t' compatible with what a thinks in w at t, $\text{P}(t')(w') = 1$. [von Stechow 1995: (2-2)]

This leads to the desired result that there is no absolute tense in attitude complements. The complement of an intensional predicate has to be of type <*i*,*t*>, thus it has to lack indexical tense and contain a bound time variable instead.

At first sight, an embedded morphological present tense does not look like a zero tense but like an indexical tense. Although *that*-clauses are tensed at PF, they have to be interpreted as tenseless in these contexts at LF. For a compositional interpretation, the difference between the morphological output and the semantic interpretation has to be explained. How do we get rid of these features? There are two general approaches to this. The first one is to formulate rules in which environments tense features have to be deleted under agreement (see Ogihara (1996), von Stechow (1995) and Kusumoto (1999)). For Ogihara, for example, a sequence of tense rule tells us that an embedded tense feature can be deleted optionally if the matrix and embedded tense are occurrences of the same feature. In Abusch (1997), temporal relations are interpreted. The proposal I will be following is the one of Kratzer (1998). She maintains that in English there are three tenses: present tense, past tense and a zero tense. The latter carries no presuppositions, i. e. is semantically vacuous.

Zero tense is a variable tense which is anaphoric to the perspective time as provided by the matrix clause. It does not carry any presuppositions, hence it is zero at LF. At PF, however, it looks like an indexical tense

present	$[\![\text{present}]\!]^{g,c}$ is only defined if c provides an interval t that includes t_0 (the utterance time). If defined, then $[\![\text{present}]\!]^{g,c}$ = t.
past	$[\![\text{past}]\!]^{g,c}$ is only defined if c provides an interval t that precedes t_0. If defined, then $[\![\text{past}]\!]^{g,c} = t$.
$\emptyset_n$	$[\![\emptyset_n]\!]^{g,c}$ = g(n)

because for spell-out, it will pick up the features from its antecedent. This feature-inheritance applies only for finite clauses. Infinitival clauses do not need tense features for spell-out because they are not finite.

In past-under-past sentences for example, the connection between the matrix and the embedded tense is visible at PF. Kratzer (1998) points out that at LF, the relationship is 'broken', as it is the attitude which binds the embedded tense.

(50) John thinks that it is 10 o'clock.

(51) [$_{TP}$ present 1 [t1 [John think that 1 [$_{TP}$ $\emptyset_1$ [it be 10 o'clock]]]]]

(52) For all of John's doxastic alternatives <w,t> in w_0 at t_0:
$[\lambda t.\lambda w.$ it is ten o'clock at t in $w](t)(w) = 1$.
[= Kratzer (1998), (31)b,c]

We have seen that due to general considerations, tense under attitudes has to be zero tense. Attitudes select for objects of type <i,t>. In English, the embedded zero tense looks like an indexical tense because it agrees with the matrix tense. Simultaneous[3] interpretations are what we get in finite past-under-past and present-under-present sentences and with infinitival complements in general. In (47), the embedded zero tense agrees morphologically with its antecedent, the matrix TP, and shows up as past-under-past.

Double access readings

What if the the embedded tense does *not* agree with the matrix tense? As we have seen, in English, a zero tense has to agree with its matrix tense. Thus, morphological present tense cannot be bound under past. However, there are readings where morphological present can be interpreted when it

[3] As Stechow points out, *simultaneous* only as a *façon de parler*: of course, in intensional complements, there is no proper simultaneity because we cannot relate subjective times and absolute times. Instead, it is temporal *de se*.

is embedded under past. It does not have a subjective now reading but what Abusch (1997) calls a *double access reading* (DA).

(53) Peter believed that Anna is pregnant.

In (53), the event time and the belief time have to overlap. (53) is interpretable only if Anna is pregnant both at the time of utterance and at the time Peter believing her to be pregnant.

If this overlap is conceptually impossible, the double access reading in English is odd.

(54) *Two years ago, Peter believed that Mary is pregnant.

As is well-known (see Abusch, 1997, Ogihara, 1996 and Kratzer 1998), these sentences — if considered grammatical — have a particular 'double access' interpretation. The pregnancy seems to be a present state, and the believing time and the pregnancy event time overlap. Abusch called this a *de re* interpretation of tense. She paraphrases sentences like (53) as 'what Peter believed about the present tense is that Anna is pregnant at this present tense'.

In a slightly different vein, Kratzer (1998) follows the view of Ogihara (1996), where it is *de re* not with respect to time but with respect to a present state. Her analysis requires type-shifting of the complement from a property of times to a property of eventualities. This eventuality becomes the *res* of the attitude and can have the implicit event argument in the attitude as the antecedent.

(55) The ultrasound picture indicated that Mary is pregnant.

(56) The ultrasound picture indicated of a present state of Mary's that it is a pregnancy.

(57) There is a state s of Mary in w_0 at t_0 such that for all ultrasound picture alternatives $<s', w'>$ of s in w_0 at t, *$[\lambda t.\lambda w.$Mary is pregnant at t in $w](s')(w') = 1$.

[Kratzer (1998), (36a,b), (39)]

The general problem of intransparent *de re* expressions is that we have to assume that the holder may have a belief about something absolute (as for the speaker), the present tense. We can solve this via counterpart relations in the sense of Lewis (1983). The tense will be anchored to the speaker's world, i. e. the utterance situation.

Remarks on German tense

While English is a sequence-of-tense language and has feature agreement, things work differently in German. In German, it is common to express simultaneity in past contexts with a present tense in the complement:

(58) Peter glaubte, dass seine Frau wunderschön ist.

Crucially, (58) does *not* have a double access reading as reported for corresponding English present-under-past sentences. As a working hypothesis, I will thus assume that present tense in German is the morphosyntactic realization of zero tense in all contexts.

Does this mean that there is no feature agreement in German? Indeed, von Stechow (2005) claims that past-under-past sentences in German have neither an anterior nor a simultaneous reading:

(59) Sie sagte mir, dass sie gerade auf mich wartete.
(*simult., *anterior.)

(60) Sie sagte mir, dass sie gerade ein Auto kaufte.
(*simult., *anterior.)
[= von Stechow (2005), similar (7-20)a,b]

There is further evidence against an agreement approach. In their classical example, Kamp & Rohrer (1983) show that in English, morphological past tense can express a time interval in the future (Abusch, 1997, (lastmeal) is a slightly modified version):

(61) He decided yesterday that tomorrow he would tell his mother that they were having their last meal together.

The morphological past on *were having* describes a time in the future, the past morphology is a morphological reflex due to feature agreement at PF. In German, this reading is unavailable:

(62) Peter hat letzten Monat beschlossen auszuwandern und entschieden, seiner Mutter nächste Woche zu sagen, dass sie zum letzten Mal zusammen aßen.

As for the intuitions on (62), the past tense in *aßen* is interpreted indexically and refers to a time before the utterance time. The reading, which is available in English, however, is unavailable in German. There is no way to interpret *aßen* as situated in a future time. This suggests that feature

agreement at PF is absent in the German example. More detailled research will have to show whether this is true for German in general. To support this assumption, I present empirical data later in this section.

In the literature, for the most part, if embedded tense is considered, intensional and extensional contexts are not distinguished. If they are considered in one class, present-under-past is sometimes considered ungrammatical (for instance Hauser-Suida & Hoppe-Beugel, 1972, who are surprised about the high range of cases of 'incorrect' present-under-past).

Solfjeld (1989) presents an empirical study of indicative tenses in reported speech. He notices that in German, both possibilities exist, past-under-past and present-under-past. According to his 'Principle 1', the embedded tense is interpreted from the viewpoint of the reported speaker, i. e. it is related to the subjective now. Interpreting according to 'Principle 2', the embedded tense is interpreted in relation with the utterance situation. In his corpus study, he analyzes more than 1200 sentences mostly from fictional texts. His results are given in table 2.1. The matrix tense is a past tense and he only considered reported speech. In order to make these results understandable in our terms, let me sum up his results for embedded present tense and past. Embedded present tense, if determined, is mostly interpreted according to Principle 1, i. e. with respect to the reported situation. This means that present tense does not yield a double access reading in German but refers to the reported now. Embedded past is mostly interpreted according to Principle 2, corresponding to the simultaneous (or *de se*) reading, as it is related to the utterance time. There are also cases of embedded past which have to be interpreted according to Principle 1, this is the backshifted reading (which we will be concerned with later), past as seen

Table 2.1: Results in Solfjeld 1989

embedded tense	Principle 1	Principle 2	Principle 1 or 2	contextually indetermined	Σ
present	115	1	245	24	385
past	75	493	0	6	574
perfect	26	4	28	1	59
past perfect	0	261	6	0	267
future	0	0	0	1	1
	217	759	279	31	1268

from the reported situation. This cannot be easily transferred to our terms here. First, it is unclear what embedded past according Principle 2 means. It may be simultaneous (co-indexed past tenses) or a true *de se* reading. Second and more crucial, reported speech differs from attitude contexts. For instance, there are many *verba dicendi* which are ambiguous between an intensional and a factive reading, *sagen* or *mitteilen* for example. For this reason, *verba dicendi* do not enter the class of intensional predicates without additional constraints.

(63) Peter teilte uns mit, dass Anna nicht anwesend war. (± factive)

Factive predicates trigger extensional contexts, and this has crucial effects on their temporal behavior. The two readings cannot be separated because Solfjeld only considers sentences with (unambiguous) predicates carrying indicative morphology. Embedded clauses carrying reportive mood would be unambiguously non-factive[4]:

(64) Peter teilte uns mit, Anna sei nicht anwesend gewesen.

Thirdly, his data base mostly comprises fictional texts. There may be effects with respect to the genre. Forthly, especially compared with mood 'selection' in reported speech, there may be a diachronic effect (for details, see section 2.2.3).

Note that I will consider only indicative clauses at this point. There will be a broad investigation of subjunctive I and II in section 2.2.3. As far as tense is concerned, subjunctive forms do not have any relevant effects. I assume with von Stechow (2005) that subjunctive I and II are featureless with respect to tense. Note that this intuition can already be found in Bech (1963) (though we have to restrict the notion 'constant' with respect to indicative):

> Beim Ind. hat das Tempus einen selbständigen zeitlichen Wert, indem das Präs. die Gegenwart, das Prät. die Vergangenheit bezeichnet. Beim Konj. hingegen hat das Tempus keinen selbständigen Zeitwert, sondern beide Tempora drücken, was die Zeit betrifft, dasselbe aus, u.zw. Gleichzeitigkeit im Verhältnis zum (indikativischen) Kontext. Das Tempus (Präs. wie Prät.)

[4]Zeller (1994) mentions that present-under-past under *sagen* has a simultaneous reading, while past-under-past has both an anterior and a simultaneous reading. Note that *sagen* has a reportive and a factive reading, and thus does not help us at this point.

> eines konjunktivischen Finitums bezeichnet also Gegenwärtiges in einem auf die Gegenwart hinweisenden Kontext und Vergangenes in einem Kontext, der auf die Vergangenheit hinweist. Man könnte somit im gewissen Sinne sagen, daß das Tempus beim Ind. einen konstanten, beim Konj. aber einen variablen, d.h. nach dem Kontext variierenden Zeitwert hat.
>
> [= Bech (1963), p. 49f]

In order to control the parameters of the empirical study, I present new data on tenses in indicative complements under attitudes. There are two central questions:

- How frequent is indicative present tense under past tense in German, especially compared to reportive mood (subjunctive I).
- How frequent is (indicative) past-under-past in German. Does it have a simultaneous or does it have an anterior reading?

As for the data, there are undoubtedly examples of temporal *de se* past-under-past sentences in German:

(65) Als der junge Mann glaubte, dass die Luft rein war, ging es erst richtig los. (COSMAS RHZ01/SEP.22197)

It is also possible to use present-under-past for expressing temporal *de se*:

(66) Nun glaubte Lugojow, dass er genügend Verteidigungsmöglichkeiten gegen das unangenehme Schach... hat. (COSMAS M04/FEB.08483)

(67) Vor diesem letzten Durchgang glaubte eigentlich keiner mehr daran, dass Spitzenreiter Peter Martin noch an einer erfolgreichen Titelverteidigung gehindert werden kann, während um die Plätze dahinter noch gerungen werden durfte. (COSMAS M04/MAI.35699)

(68) Der 61-Jährige glaubte, dass sein Kollege ein Verhältnis mit seiner Ehefrau hat. (COSMAS M04/MAI.31259)

In the study, only two matrix predicates were analyzed, *glauben* and *denken*. Only matrix sentences carrying past tense were considered and for the *glauben*-sentences only those with the argument structure *glauben, dass* (i. e. ignoring all cases of *daran glauben, dass*). More than 440 sentences were considered, all of them taken from a subcorpus of COSMAS, the *mma*

subcorpus which contains (local) newpaper texts from the period 1995-2008. All items containing different argument structure like *daran glauben, dass* or *daran denken, dass* were excluded as a precaution. For every sentence, the embedded morphological tense and mood and the temporal relation between the matrix and the embedded event (as deducible from the context provided by the corpus) were analyzed.

Table 2.2 presents the indicative results for *denken* and *glauben* for simultaneous and anterior relations. Since we are interested in the contrast between indicative past-under-past and indicative present-under-past, I exclude posterior sentences and all sentences carrying subjunctive mood in the embedded clause.

Table 2.2:

Matrix tense	embedded tense	simultaneous *denken*	*glauben*	Σ	
past	present tense	146	60	219	86.2 %
	present perfect				
	past perfect				
	past	20	19	35	13.4 %
				254	100.0 %

Matrix tense	embedded tense	anterior *denken*	*glauben*	Σ	
past	present tense				
	present perfect	8	5	13	32.5 %
	past perfect	5	3	18	45.0 %
	past	4	5	9	22.5 %
				40	100.0 %

In contrast to the results of Solfjeld (1989), past tense in a *de se*/simultaneous reading was found only in 13.4 % of the *de se* cases (45.3 % in Solfjeld's results). Possible explanations for this difference were given above. This study clearly shows that for *de se* readings, present tense is the unmarked option in contrast to past.

Is past (under past) interpreted as anterior? Among the anterior cases, only 22.5 % were past — it does not seem to be the preferred option for expressing anteriority under past matrix sentences. Considering only the

embedded past cases, only 20.5 % are anterior — past does not show a tendency to be interpreted as anterior. Instead, these results confirm the judgements given in von Stechow (2005) who considers past under past in German marked both for simultaneous and for anterior temporal relations. However, there are way too many cases found to judge it ungrammatical — especially if we consider the high amount of simultaneous past-under-past in Solfjeld's study. Thus, we have to find a way of explaining both options, present and past under past in German. This means that German is not a SOT-language.

Simultaneous and anterior readings of past-under-past Let us consider the simultaneous/*de se* readings first. How can we explain the past-under-past cases? Firstly, we could derive the simultaneous reading if we allowed anaphoric tenses in past-under-past sentences in a manner parallel to English. We would have to consider German a language which optionally shows agreement in the temporal domain. Second, we could invoke a *de re* reading analogous to double access readings in English. If present-under-past in German is the unmarked option for expressing zero tense, then past-under-past has to be interpreted — by analogy with present-under-past in English.

The LFs for both options are given below. (69a) is the LF which considers temporal agreement as optional — parallel to past-under-past in English. (69b) is the LF for the double access reading on a *de re* account similar to Abusch (1997). The embedded tense is interpreted and we get a complement of type <s,t> instead of <i<s,t>>. As we run into the same difficulties with double access readings in English, I will not go into the formal details here. Any formalization for English DA readings will do for German past-under-past as well.

(69) Sie dachte, dass Vater und Sohn sich sehr ähnlich sahen. (simult.)

a. [$_{\text{TP}}$ past 1 [t$_1$ [sie denkt dass 1 [$_{\text{TP}}$ $\emptyset_1$ Vater und Sohn sehen sich sehr ähnlich]]]] (optional agreement)

b. [$_{\text{TP}}$ past 1 [t$_1$ [sie denkt dass [$_{\text{TP}}$ past 2 [t$_2$ Vater und Sohn sehen sich sehr ähnlich]]]]] (double access)

Let us now consider the anterior reading of past-under-past.

(70) Peter behauptete gestern, dass Anna ihn das ganze vergangene Jahr über betrog.

As mentioned already, von Stechow (2005) does not allow a backshifted reading in German past-under-past sentences. However, there were a seriously high amount of past-under-past cases found in the corpus. The *de re* analysis would also cover anterior readings of German past-under-past if the free past tense denotes a salient past time which is anterior to the matrix event. However, we have to rule out cases in which the embedded past tense denotes a time interval after the past tense of the matrix clause. (71) is ill-formed:

(71) *Peter glaubte vorgestern, dass Maria gestern krank war.
Peter believe$_{past}$ the other day that Maria yesterday sick be$_{past}$

However, this can be excluded by the Upper Limit Constraint proposed by Abusch (1997):

(72) ULC: The local evaluation time is an upper limit for the reference of tenses.

The embedded indexical tense has to denote a time interval which does not follow the matrix past tense.

I have suggested that in German, zero tense is expressed morphologically by present tense which is not interpreted but has to be taken as featureless at LF. Morphological past under past with a simultaneous or anterior interpretation was analyzed as temporal *de re*.

Embedded future: *believe* vs. *expect*

If present-under-present in German has a simultaneous reading — what about examples like (73)?

(73) Peter erwartet, dass Anna gewinnt.

Anna's winning is not simultaneous with Peter's belief time. This, in a nutshell, is the problem with future-oriented predicates.

According to Abusch (2004) there are two verb classes. B-verbs are verbs like (74) while in (75) there are examples of F-verbs.

(74) *believe, assert, claim, confess, know*

(75) *expect, forecast, intend, plan*

The both classes differ with respect to their temporal specification of the complement. B-verbs require simultaneous interpretations. Infinitival complements of B-verbs, too, require simultaneousness. They are incompatible with past and future frame adverbs in the complement (top-level predicate) as illustrated in (76) and (77).[5] They are incompatible with non-stative complements (cf. (78) vs. (79)). Furthermore, they are equivalent to finite complements with simultaneous interpretation, whether they are present tense or sequence-of-tense past, see (80).

(76) Guido is believed to be at Monique's place last night.

(77) *Guido is believed to be at Monique's place tomorrow night. (wellformed on a 'scheduling interpretation of the complement')

(78) *Guido is believed to visit Stockholm. (wellformed in a generic reading)

(79) Guido is believed to be in Stockholm.

(80) Guido was thought to be in Stockholm. – It was thought that Guido was in Stockholm.

[= Abusch (2004), 7a, 7b, 14a, 16a, 21a,b]

F-verbs in contrast, are fine with future-oriented adverbs (cf. (81)) but not with past adverbs like in (82). F-verbs are compatible with both stative and non-stative complements (cf. (83) and (84)). With some exceptions (like *pray, hope*), they are not equivalent to tensed (present tense or sequence of time-past) complement clauses (85).

(81) Bibi is predicted to be in the lead next week.

(82) *Guido is predicted (by almost everyone) to spend the night of last Friday's party at Monique's place.

(83) Guido is expected to visit Stockholm.

(84) Guido is expected to be in Stockholm.

[= Abusch (2004), 13a, 25, 15a, 17a]

[5] The past adverb is possible in the case of an infinitival complement with *have*:

(i) Guido is believed to have been at Monique's place last night.

[= Abusch (2004):(8)b]

(85) Guido was expected to be in Stockholm. – *It was expected that Guido was in Stockholm.

What can be concluded about the *to*-infinitive in English is that infinitives exclude past readings. But how can we account for the future-oriented interpretation? Abusch (2004) points out that the paraphrase for (86) can be given as in (87).

(86) It is predicted that Barak will win.

(87) I say that the proposition that Barak will win will turn out true.

[= Abusch (2004), 30, 31]

She proposes that the future-oriented interpretation of infinitival complements is due to an abstract element FUT which behaves just like *will*. This is why past readings are excluded: (86), as well, does not have a past reading because of *will*. Does this FUT element belong to the infinitival character of the complement or does it belong to the lexical semantics of the F-verb?

Complement clauses denote properties of times. The tense of the complement clause is lambda-abstracted. *Will* leads to a substitution of the tense feature which replaces t by λP λt P((t, ∞)). Present tense and past tense embedded in future-oriented contexts can be shifted. F-verbs which are obligatorily future-oriented behave as if they had *will/would* in their complement. Abusch (2004) shows in (88) and (89) that present tense and past tense are shifted as shown for the case of *will*.

(88) Mary intends to give an automatic A to every student who submits a term paper at least 15 pages long.

(89) On June 1, Mary intends to give an automatic A to every student who submitted a term paper at least 15 pages long.

[= Abusch (2004), 53, 54]

Predicates which allow a simultaneous interpretation of the complement carry slightly different information in the time interval part of the operator. Instead of λPλtP(t, ∞), it is λPλtP[t, ∞) which includes the left boundary t. B-verbs, on the contrary, lack this temporal operator. This is the reason why infinitival complements get a simultaneous interpretation. Thus, for Abusch, the future-orientation with *expect* is part of the lexical semantics and not a contribution of the infinitive. We will see that this is correct,

but it does not account for the differences between finite and non-finite complements. This was pointed out by Katz (2001).

Katz (2001) agrees with Abusch in most respects. But he points out one problem. If we assume that there is a temporal operator as being part of the lexical semantics of the matrix predicate which for some predicates requires a futurate interpretation of the complement — why doesn't this work for future-oriented predicates and present tense tensed complements?

(90) ?Peter expects that he is in Paris.

Example (90) does not have a future-oriented interpretation — it is clearly suboptimal. While with present-oriented (or temporally neutral) predicates, the tense of the tensed clause is abstracted over (which makes the tensed clause synonymous with the infinitival clause), in the case of *expect* we cannot treat it correspondingly. Either we have to assume that the future-orientation holds only for infinitival complements (then we will have to stipulate that finite complements have to be overtly future-oriented), or we require a future-oriented complement and run into problems in the infinitival case. Katz (2001) offers a solution for this puzzle which I will outline here. He suggests that all tenses embedded under attitudes are to be analyzed with respect to the 'local now'. We have already seen this approach for backshifted readings of past-under-past. In past-under-past sentences, the backshifted reading results if we analyze the embedded event to be before the subjective now. It is a relative tense, and this is at first sight incompatible with an anaphoric treatment of tense. Katz follows von Stechow (1995) in analysing tenses as relational operators (for 'shifted' readings from the subjective now). Its arguments are the perspective time and the event time and a temporal predicate. The particular relation between perspective time and event time is required by the semantics of the tense.

(91) a) $[\![_i\text{PRES}_j]\!]^g(P)(w) = 1$ iff $g(i) =_w g(i)$ and $\text{P}(g(j))(w) = 1$

b) $[\![_i\text{PAST}_j]\!]^g(P)(w) = 1$ iff $g(i) <_w g(i)$ and $\text{P}(g(j))(w) = 1$

c) $[\![_i\text{FUTR}_j]\!]^g(P)(w) = 1$ iff $g(i) >_w g(i)$ and $\text{P}(g(j))(w) = 1$

Tenses can now be free variables which can be bound and be binders themselves. There is a tense operator (PRES, FUTR, PAST) which may be marked with the feature [past]. Morphologically, for instance FUTR[past] is spelled out as *would* while FUTR is spelled out as *will*. The feature [past] is passed on to the complement.

(92) John believed that Bill would leave.

(93) John $_0$PAST[past]$_1$ believe that λ 1 [Bill $_1$FUTR[past]$_2$ leave]
[= Katz (2001), (37)]

In (93), the FUTR operator is bound by a past matrix tense. Lambda-abstraction loosens the binding relation between both tenses. In an elegant way, Katz (2001) can now solve the ambiguity of past-under-past sentences. PRES[past] and PAST[past] are both spelled out morphologically as *-ed*. This results in two different readings:

(94) Fritz believed that it was raining.

(95) Fritz $_0$PAST[past]$_1$ believe λ 1 [it $_1$PRES[past]$_2$ be raining]
(simultaneous reading)

(96) Fritz $_0$PAST[past]$_1$ believe λ 1 [it $_1$PAST[past]$_2$ be raining]
(backshifted reading)

(97) $\exists$ t [t$<t_0$ & $\forall\langle w',t'\rangle \in$ Dox(w_0,t,John) $\exists$ t'' [$t'' = t'$& rain(w',t'') = 1]]

(98) $\exists$ t [$t<t_0$ & $\forall\langle w',t'\rangle \in$ Dox(w_0,t,John) $\exists$ t'' [$t'' < t'$& rain(w',t'') = 1]]
[= Katz (2001), 40a,b, 41a,b]

Coming back to *expect*, the difference between predicates like *believe* and future-oriented verbs like *expect* is in the logical type of the complement. Normally, we abstract over the perspective time index only and the event time is (usually) existentially bound. Katz (2001) proposes that with future-oriented verbs, there is additionally abstraction over the event time index. A tensed complement will now have to be abstracted over twice:

(99) Fritz expects that Arnim will laugh.

(100) Fritz $_0$PRES$_1$ expect λ 1 λ 2 [Arnim $_1$FUTR$_2$ laugh]

(101) $\forall\langle w',t'\rangle \in$ Dox(w_0,t,John) $\exists$ t'' [$t'' > t'$& laugh(w',t'',Arnim) = 1]]
[= Katz (2001), 43a, 44, 45]

This analysis makes sure that the complement of *expect* has to be future-oriented.[6] The temporal specification of the complement has to match the

[6] Assuming future orientation does not imply assuming a 'future tense'. It may be situated in an intermediate position between tense and modality. I will not go into the modal ingredient of temporal future here.

one of the matrix predicate. If we inserted a present tense complement, the temporal specifications would be $t" > t'$ and $t" = t'$ at the same time. Note that Katz' analysis breaks with the view that tenses in intensional contexts lack interpreted features: 'We need to confront the fact that tenses have semantic content' (p. 250) — indeed, some of them are relational.

The insight of Katz is that there must be another time involved — the event time. This is transparent in past sentences with *expect*:

(102) Peter expected that Anna would become pregnant.

In (102), the past feature of *would* witnesses that there is an anaphoric zero tense, the perspective time. That means that in present-under-present sentences, the embedded tense is *not* (only) a zero tense. If it were, it should be grammatical like its German (truly tenseless) counterpart.

(103) *Peter expects that Anna is successful.

(104) Peter erwartet, dass Anna erfolgreich ist.

This challenges all approaches where tense is uninterpreted when we have feature agreement. Now, Katz' idea relies on the assumption that in tensed clauses, we may specify the temporal relation between the perspective time and the event time twice. As long as there is no conflict between the resulting relation and the relation provided by the lexical semantics of the predicate, the sentence will be grammatical. Hence, the embedded tense comprises the anaphoric/zero part (which is not interpreted but identified with the perspective time) and an interpreted part which tells us what the temporal relation is like.

We have to meet this relational requirement only if we interpret tense (indexically or as a relational operator). If there is only zero tense, the predicate will guarantee the correct relation. This is the case with infinitival complements which (in English and German) receive a future-oriented interpretation.

(105) Fritz expects Arnim to laugh.

(106) Fritz $_0$PRES$_1$ expect λ 2 [Arnim to laugh]

(107) $\forall \langle w',t' \rangle \in \text{Dox}(w_0,t,\text{John}) \; \exists \; t'' \; [t'' > t' \& \; \text{laugh}(w',t'',\text{Arnim}) = 1 \;]]$
[= Katz (2001), 48, 49, 50]

The advantage is that while with tensed complements the temporal relation is specified twice (by the matrix predicate and by the complement), with

untensed complements, there is only one specification. There will not be any clash between the complement and the requirements of the matrix predicate. Double specification is allowed if the specifications match. An infinitival complement can receive any temporal specification required by the matrix predicate.[7]

We will now investigate whether Katz' analysis accounts for German tense system as well with respect to future-oriented verbs.

In German, the overt future marker is not obligatory in tensed complements under future-oriented verbs:

(108) Peter erwartet, dass Maria ihn auslacht.

In a corpus study, complements under *erwarten* 'expect' were analyzed with respect to their temporal specifications. The a corpus study used COSMAS in the subcorpus *nun - Nürnberger Nachrichten, Januar 1990 - Juli 2008* and *mm - Mannheimer Morgen, Januar 1995 - Juli 2008*. The search query is: *erwarten OR erwarteten /+w4 dass*.[8]

With a present matrix tense, the results as shown in Table 2.3:

Table 2.3:

Matrix tense	Embedded tense	Hits	%
present tense	present tense	200	64.5 %
	future tense	110	35.5 %
	Σ	310	100.0 %

This supports the claim that in German, morphological present tense is the unmarked tense under a future-oriented predicate. German differs in this respect from English where present tense under *expect* is ill-formed. How can we account for this? Does this necessarily mean that present tense is zero tense?

[7] In English, a *for*-complement is possible as well.

(i) Peter expects for Mary to accept the offer.

In the analysis of Portner (1997), *for*-infinitives are tenseless but future-orientated. They should fit in as well but I will not go into this issue here.

[8] Note that German *erwarten* 'expect' has two readings. The first can be paraphrased with an epistemic predicate as in *glauben/davon ausgehen*, the second has a deontic flavour *verlangen*. Only epistemic *erwarten* was considered, and if there was doubt, the example was omitted.

This may be an epiphenomenon of the fact that generally, German present tense may be interpreted as future-oriented:

(109) Peter besucht morgen seine Oma.

(110) Peter wird morgen seine Oma besuchen.

Thus, for (109) we can assume that it contains a covert future (for a formal discussion see von Stechow, 2005). Its interpretation would then correspond to the one of (110). As it is generally accepted that German(ic) present tense may refer to a future time (Matzel & Ulvestad, 1982; Thieroff, 1992; Gelhaus, 1975), this is a reasonable explanation at this point. The German data would then correspond to the English data, given that present tense sentences potentially contain a covert future which corresponds to a future tense.

Still, there is one reason why I will not pursue this idea here. My argument rests upon analogy: We will see that this option may be the most straightforward approach in order to explain what happens, but that this approach cannot be transferred to mood. It may well be the case that every present tense in German contains a covert future tense, but we will not claim accordingly that every indicative mood contains a modal interpretation. This is why I present a more general alternative here: if we consider present tense a possible realization of zero tense, we can parallel finite present tense clauses with infinitival complements.

With a past matrix tense (past), there was PF future, past, present and *würde* in the complements:

Matrix tense	embedded tense	items	%
past tense	future	19	17.1 %
	past	9	8.6 %
	present	65	62.8 %
	würde	12	11.4 %
	Σ	105	100.0 %

Thus, German allows a wide range of tenses in the complement of tenses in these complements. Again, the unmarked tense is the present tense.

Following are examples for these four groups:

(111) Branchenexperten erwarteten, dass die anderen Tankstellenkonzerne nachziehen werden. (M00/OKT.63989) (future tense)

(112) Wer aber beim 'Happy End' erwartete, dass sich die beiden Liebenden in die Arme nahmen, schmunzelte beim Anblick des leidgeprüften Helden. (M05/JUN.50307) (past)

(113) Die Polizei erwartete, dass 20 000 Gegendemonstranten auf die Straße gehen würden. (NUN00/NOV.01655) (*würde*)

(114) a. Der Streifenwagen sei zu der Stelle gefahren, wo die Beamten erwarteten, dass die Mädchen ans Ufer kommen.
(M03/FEB.11992) (present tense)

b. Wer erwartete denn, dass das Bomber Command erneut eine Stadt angreift, über der es in einer Nacht mit ähnlichen Wetterbedingungen so entsetzliche Verluste erlitten hatte?
(NUN04/DEZ.00343) (present tense)

The results from the corpus study are compatible with Katz' account only if we assume that present tense complements may be zero tense since there is no obligatory feature agreement in German. If present tense denoted the subjective now, a future tense would still be necessary. If it was a relative tense, it would lead to a clash between the two specifications. This is not the case. *Würde* as a combination of anaphoric past feature and the future tense — which is obligatory in English — plays only a marginal role (11,4%). Again, it supports the suggestion that optionally, there is feature agreement in German as well.

This holds for the past examples as well. For interpretation, we need to interpret the embedded past as anaphoric. Thus, the complement is tenseless and can be interpreted correspondingly with an infinitival complement, i. e. according to the temporal specification provided by the future-oriented predicate. Speakers who allow anaphoric past in German should find past tense under matrix past tense with *expect* grammatical. It is a zero tense (visible via agreeement) which then denotes a zero tense which is shifted by the lexical semantics of the predicate. Just like past-under-past in sentences containing temporally neutral predicates (like *glauben*), this option is marginal again.

In sum, if we assume that the future-orientation comes from the predicate, then the zero tense cases can be explained. This comprises infinitival complements, present tense (under all tenses) and anaphoric tenses (feature agreement, past-under-past).

I will thus assume that Katz' analysis is right for English. For German, we have to assume that morphological present is not relational but completely featureless. This fits with present-under-past in German which also behaves like temporal PRO.

Concepts and derived *de se*

In section 2.2.1, I presented the idea of a *concept*-position in the scope of an attitude, basically based on the one proposed in Percus & Sauerland (2003a). Ignoring tense for a moment, the lexical properties of the attitude provide specifications for the concepts: firstly, there are default relations concerning individuals for *de se* attitudes. Second, it depends on the concept-generator which individual concepts are licit in the concept, i. e. what is accessible depending on the type of attitude (recall the contrast between *dream* and *believe*). In the *de se*-reading, the default self-concept is combined with the (self-ascribed) property of individuals. This is what happens with infinitival complements which denote properties of individuals. Within finite clauses, there is a pronoun which needs to be interpreted or to be moved via a relative-pronoun mechanism as suggested by Percus & Sauerland (2003a). Technically, what we do is substitute for the self-concept — which was the default relation anyway — an individual concept which can be identified with the holder's self. In a way, this is semantically redundant, but necessary since finite clauses require overt subject pronouns which will automatically be interpreted if not moved into the concept-generator, identified with the holder's self and thereby 'neutralized' at LF.

de dicto	movement under concept generator (only with licit relations depending on the concept generator)
de se	PRO (featureless)
derived de se	movement under concept generator and identification with holder's self. (only if this relation corresponds to the default relation)

Now, let us see how tense fits in. For predicates like *glauben*, the default relation is simultaneity, but, since we can have beliefs about our past and future as well, the concept allows more than simultaneity. An infinitival clause will be interpreted as temporally *de se*. For finite clauses, we have

very different options. The first option is to consider German morphological present tense featureless. Secondly, we could interpret present tense as relational operator in the sense of Katz (2001). Considerations from future-oriented predicates suggest that the first option is to be preferred. If the relation is one of non-simultaneity, the tense may be interpreted as a relational tense. For German, perfect tense and past perfect seem to be the most preferred tense for anteriority, though past is possible in principle either.

With *expect*, only future events are accessible in the concept. Intuitively, only futurate times (or the futurate part of the embedded property) are accessible when we expect something. The relation between the subjective now and the time we have a belief about is a relation of posteriority. In English, we have to meet this requirement for the event time. In fact, this is a *derived de se* reading. We substitute for the default relation a relation which corresponds to this. The default relation is posteriority, so the overt, relative future tense also expresses posteriority. Like moving and identifying a pronoun as the holder's self (which is the default relation anyway), we can specify the default relation — this will not have any interpretative effect if it equals the default relation. Since the concept-generator of *expect* admits only (concepts of) future times, this is the only option in English.

In German, however, there is a second option. German present tense may be featureless, a licit realization of zero tense. It truly behaves like featureless tense in infinitival complements. Thus, in German, there are two possibilties: firstly, we can have a temporally *de se* expectation which requires zero tense (which comes out as present tense), as in (115). Secondly, we may specify the default relation in a way which is redundant, similar to English. This is what happens in examples like (116).

(115) Peter erwartet, dass Anna gewinnt.

(116) Peter erwartet, dass Anna gewinnen wird.

Note that if we assumed that the future tense was interpreted additionally with the 'future-shift' brought along by the future-oriented predicate, we would have to shift twice — this is not the case. This is the insight of Katz (2001) who introduces future tense as a relative operator. This relative operator, which is necessary with future-oriented predicates in English, corresponds to the specification provided in the lexical semantics of *expect*. Most interestingly, Katz (2001), in a footnote, adds:

> It might be the case that these specifications have somewhat different force. The marginal acceptability of non-future tensed finite complements indicates that the temporal specification associated with the lexical entry for *expect* might, in fact, be some sort of default presupposition which an overt tense can override.

Overriding the default relation in the concept by a identical specification which is moved into the concept is the crucial ingredient of *derived de se*.

For the analogous case for mood (see section 2.3), we will have strong evidence that the 'default presuppositions' (which I prefer to call 'default relations') are overridden in finite complements.

Preliminary summary

Percus & Sauerland (2003a) suggest that *de se* beliefs differ from *de re* beliefs in the semantic type of the complement. A *de se* belief denotes a property of individuals while a *de re* belief denotes a proposition. Under the assumption that a personal pronoun can be like a relative pronoun in that it moves and turns the complement into a property of individuals, they were able to derive a *de se* belief from a finite clause (containing a pronoun). Whether the pronoun is identical with the holder's self or not makes the difference: a *de se* belief can only be derived if the moved pronoun is 'recognized' as the self. In English and German, there are no spelled-out logophoric pronouns. A pronoun like *he* does not tell us anything about whether it is an identity or an acquaintance-based relation, thus it is ambiguous.

In this section, I have described traditional analyzes of bound zero tense under attitudes. Temporal *de se* beliefs denote properties of times. The zero tense is bound by the attitude (in intensional contexts, i. e. not by the matrix tense), and the lexical binder binds it under a concept generator. It is a subjective or perspective time then. There may be further requirements on the embedded tense.[9] Future-oriented predicates select for properties

[9]Possibly there are predicates which require an anteriority relation between the perspective and the event time. The problem in finding examples is that most predicates tend to be factive when being past-oriented. One example is non-factive *erinnern*. We need a subjective concept of *erinnern*. This subjective *erinnern* may take a present tense as well. This may be an explanation for some occurrences of historical present tense which usually has a subjective flavor — we will see that this is due to a type-shifting effect. The zero tense turns the cognitive factive *erinnern* into an attitude — the belief will be marked with subjectivity as it stands in contrast to a fact.

of times which bring along a posteriority relation between the perspective time and the event time. Katz (2001) accounted for this by assuming that future-oriented predicates select for properties of properties of times. The two tenses have to stand in a certain relation.

More abstractly, as with pronouns, there is a default relation and licit relations. There are four possible scenarios:

a. The temporal relation is the default relation. The default relation for temporally neutral predicates like *glauben* is simultaneity, for future-oriented predicates, the default relation is posteriority. Morphologically, we get this default relation with English infinitival complements, in German with both featureless tenses: infinitival complements and morphological present tense with a zero interpretation.

b. The temporal relation is a licit relation which is not the default relation. We can see the difference with *believe*: The default relation of *believe* is simultaneity, but other relations are not excluded. Since we can have beliefs about our past and our future, these relations are not excluded. We need relative tenses in order to express backshifted (and forward-shifted) readings.

c. The temporal relation may be in conflict with the licit relations, for instance a present tense under a future-oriented predicate:

   (117) *Peter expects that Mary wins.

   Future-oriented predicates exclude simultaneity, hence (117) is ungrammatical. (This ungrammaticality does not arise in German since present tense may be analyzed as zero tense directly. Since zero tense will take over the default relation and the default relation is always a licit relation, a present tense will never be ungrammatical in German.)

d. The temporal relation may substitute for the default relation. In contrast to the first scenario, the relation is expressed (since the embedded tense

(i) Ich erinnere mich noch (daran), dass ich das Buch dorthinlege und dann rausgehe. Aber wo ist es jetzt?

(ii) Ich erinnere mich noch (daran), das Buch dort hinzulegen und dann rauszugehen.

As expected, the tenseless infinitival complement is synonymous with the present tense in this context.

is not zero but interpreted), but it is interpreted as a relative tense which expresses a relation which is identical to the default relation. In this case, we have a *derived de se* reading. This is invisible with present tense complements under *believe* but important for future-oriented predicates. In Katz' approach, the temporal relation is specified twice, but as reported, we can also conceptualize the default relation as being overridden.

(118) $[\![\text{expect}]\!](w,t,x,P) = 1$ iff $\forall <w',t'> \in \text{Dox}(w,t,x)\ \exists t''\ [t'' > t'\ \&\ \text{P}(w',t'',t') = 1]$

Necessarily, *derived de se* readings only occur in finite complements. In non-finite complements, since they are completely featureless, there is no relation expressed which could substitute for the default relation.[10]

2.2.3 Binding of mood

Variable mood

Grammatical mood in German comprises indicative, subjunctive I (reportive mood) and subjunctive II (irrealis).

(119) Peter ist zu Hause. (indicative)

(120) Peter sei zu Hause. (subjunctive I)

(121) Peter wäre zu Hause. (subjunctive II)

I will not attempt a descriptive analysis of the mood system in German (for more detailed studies, see Kasper (1987b), Thieroff (1992), Fabricius-Hansen (1999) and Fabricius-Hansen & Saebø 2004). Instead, I would like to present how a variable-tense approach can fruitfully be transferred to mood in German. Thus, my claim is that we can treat mood in analogy to tense. To my knowledge, the first one to argue that there is an anaphoric mood similar to temporal anaphors is Roberts (1989). The following examples are taken from Stone (1997):

[10] One possible exception might be infinitive perfect complements under predicates which require anteriority:

(i) Er erinnert sich, das Buch dort hinzulegen.

(ii) Er erinnert sich, das Buch dort hingelegt zu haben.

Since I am not sure about interpretative differences between the two sentences, I leave this for further research.

(122) A wolf might walk into the house. It would eat you.

(123) If a wolf walked into the house, it would eat you.

[= Stone (1997), 4, 5]

In (122), *would* in the second sentence intuitively refers to the same 'set of possible worlds' as *might* in the first sentence — this is what 'modal subordination' is about. It is a variable which will be coindexed with a salient set of possible worlds. (123) follows the same mechanism, but the variable is bound. In the analysis of Stone (1997), any conditional is a case of bound-variable modality because the standard analysis in possible world semantics is that conditionals quantify over possible worlds. Stone (1997) parallels *when-* and *if*-clauses. In the *when*-clauses, there is quantification over times while in *if*-clauses, there is quantification over 'scenarios' (p. 7).

(124) If a concert goer arrives late, he or she will not be permitted into the auditorium until intermission. [= Stone (1997), (24)]

Pronouns, tense and mood are parallel in their presuppositions. Pronominal anaphora carry presuppositions about their referents. In the case of pronouns, these presuppositions concern number, person and gender.

(125) Pedro owns a donkey. He beats it. [= Stone (1997), (27)a]

Indexical tenses carry presuppositions about their relationship to the utterance time and the actual world (i. e. the utterance situation). Mood carries presuppositions about the relationship between the possible world and the utterance world.

Futhermore, there are parallels in adverbials and clauses. Just like tense morphemes, temporal adverbs and temporal conjunctions are interpreted with respect to reference times. Modal adverbs like *otherwise*, *then* and *if*-clauses do the same job (cf. Stone, 1997).

If we assume that mood behaves like a variable just like tense, we would expect that there are variable bound readings of mood and other phenomena known from the semantics of tense. I will show in the remainder of this section that this is true.

On a standard approach, the world variable in complements of attitudes is bound by the attitude. It might seem trivial however to claim that mood is bound, i. e. that there is zero mood embedded under attitudes. This assumption has to be made in standard semantics and is seldom made explicitly, for

instance in von Stechow (2009): 'Since indicative forms are possible under attitudes, Germ. indicative forms are neutralised with respect to mood' (p. 15). In my thesis, the assumption of zero mood is implemented and falls out naturally. I will argue that there is indexical use of mood in embedding contexts as well so that this claim has to be embedded into the whole system of person, tense and mood. We will see that bound mood has a *de se* reading perfectly analogous to *de se* tenses.

Stone's approach has been extended by Schlenker (2004). He hypothesizes that sequence of tense rules should be extended to (person and) mood. Consider an indicative-under-indicative sentence:

(126) She thinks that it is raining. [= Schlenker (2004), (21)]

Most importantly, if the embedded indicative were to refer to the utterance world (as everyone will necessarily have to assume who does not assume mood to be something like a zero mood), the set of worlds compatible with the attitude holder's belief about p should be evaluated with respect to the actual world. This, obviously, is not the case. We need an analysis which treats person, tense and mood alike: they all have indexical and variable bound occurrences, and bound mood is not interpreted indexically.

In fact, there are many occurrences of indicative mood which have to be zero mood. Under attitudes, this is surely the case. But also in final and consecutive clauses like (127), the indicative must not be interpreted because it is not intended to anchor the proposition to the actual world, but rather to an irrealis world.

(127) Er würde sich so sehr aufregen, dass er Bluthochdruck kriegt/kriegen würde.

The binding of the mood and tense variables has to come from part of the conjunction (see Lohnstein, 2005, for a quantifcational approach to adverbial clauses). Thus, argument clauses and non-argument clauses are different because only the former are interpreted within the frame the matrix predicate brings along. It is the attitude which brings along a lexical binder for person, time and mood. With non-argument clauses, it is the connector.

We have seen that there is morphological present which cannot be interpreted as indicative, hence it needs to get a bound variable interpretation. This is parallel to present-under-present for tenses. There are cases of mood anaphoric to the matrix mood as well (analogous with past-under-past in

German), for example in (128):

(128) Wenn Peter glauben würde, dass Maria schwanger wäre, ...

(129) [$_{MP}$ CONJ 1 [t1 [Peter glaubt dass 1 [$_{MP}$ $\emptyset_1$ [Maria schwanger sein]]]]

Irrealis mood can be anaphoric just like indicative mood.

(130) Peter würde glauben, dass du dich scheiden ließest.

(131) [$_{MP}$ conj1 [Peter glaubt dass 2 [$\emptyset_2$ du lässt dich scheiden]]].

I have shown in section 2.2.2 that German present tense (in contrast with English present tense) has to be zero tense, i. e. truly *tenseless*. This holds for indicative as well since we can easily construct sentences where the indicative behaves like zero without feature agreement. Just like present tense may be anaphoric to the subjective now (no matter what the matrix time is) in German, indicative may count as zero mood anaphoric to the subjective world, for example in (132). The zero mood seems to 'take over' the subjective world variable as provided by the semantics of the attitude.

(132) Wenn er sie so sähe, würde Peter sicher glauben, dass Maria schwanger ist.

The intended reading is not an indexical reading (with indicative referring to the utterance world), but a bound reading. In sum, just like present tense in German, what looks like indicative has two readings: a zero variable reading in intensional contexts, and of course the indexical interpretation in extensional contexts (for instance in root clauses).

In English, it seems to me, what looks like indicative may (in contrast to English present tense) be zero mood as well and denote the belief worlds in (133). Informants have told me that (133) is informal. The high-standard version might be (134) with a feature agreement.

(133) Peter would surely believe that Mary is pregnant.

(134) Peter would surely believe that Mary was pregnant.

Speas (2006) points out that the presence of a world variable in syntax can be proved by c-command effects in sentences like (136):

(135) Every boy must be stupid. [= Speas (2006), (28)a]

(136) If every boy thinks he failed the exam, he must be stupid.

(137) Every boy thinks he must be stupid. [= (25)a]

In (135), as is well-known, the modal *must* involves quantification over epistemic worlds. The 'holder' in this case is the speaker. The same goes for (136) where the attitude *think* does not c-command the root clause so that the world variable cannot be bound by the attitude. In (137), however, the attitude c-commands the epistemic modal and thus we get a sloppy reading for the epistemic modal base. Furthermore, Speas (2006) shows that there can be antecedents for the modal base, i. e. the relevant set of worlds in the modal base. This holds both for epistemic modals in root clauses (with regard to the speaker) and in embedded clauses (with regard to the holder).

(138) Judging from your expression, you must be upset.
[= Speas (2006), (32)a]

(139) Peter believes that judging from her expression, she must be upset.

Up to this point, we have seen that there are bound readings of mood. In the bound reading, the holder evaluates all of his doxastic alternatives. With all possible worlds accessible to him, there will be a set of worlds compatible with the belief content.

(140) Peter believes that Mary is pregnant.

(141) $\forall w' \in \mathrm{DOX}_{Peter,w0}$, Mary is pregnant in w'.

In intensional contexts, embedded mood is trivially bound because it is quantified over.

Under the assumption that mood behaves like tense, we would expect 'backshifted' readings as well. These would expresse the relation between a 'perspective world' and an 'event world'. Since we are dealing with quantification, we have relations between sets, i. e. identity relations or subset relations. We need subset relations for the interpretation of sentences like (142):

(142) Peter glaubt, dass Anna ihn verlassen würde (wenn sie von seinen Eskapaden wüsste).

The embedded mood has to consist of two world variables. The first is the subjective world (which is not a single possible world of course but a set of world quantified over). This corresponds to the perspective time. Anchored to doxastic alternatives, a conditional has to be interpreted. The quantification in the conditional starts from within the holder's belief worlds. The modal base of the conditional is restricted by doxastic accessability.

Furthermore, there are modal double access readings as reported by Schlenker (2004). In English, temporal double access readings are the only possible readings of present-under-past readings. As we have seen for tense, English only has anaphoric tense which means that at PF, the embedded tense has to agree with the matrix tense. If it does not, the embedded tense gets an indexical interpretation:

(143) He already thought ten days ago that she is pregnant.
[= Schlenker (2004), (29)b]

(144) [$_{TP}$ PAST 1 [t$_1$ [Peter glaubt dass [$_{TP}$ PRES 2 [t$_2$ Maria schwanger sein]]]] (temporal double access)

The same holds for mood: Modal double access readings are to be expected in indicative-under-subjunctive contexts. Schlenker (2004) illustrates this point using factive predicates in conditionals which I will mention only briefly and return to later.

(145) If John learned that Mary was/were pregnant, he would be devastated.

(146) If John learned that Mary is (now) pregnant, he would be devastated.

[= Schlenker (2004), 31a,b]

(145) does not presuppose Mary's pregnancy while (146) does — for some speakers. Schlenker argues that this effect arises because we have a double access to both the actual world and the world picked out by the conditional. Schlenker admits that these judgements are not robust. This observation is correct for English and for German. Why? We have seen in realis-under-irrealis sentences that feature agreement at PF is not necessary in the modal domain for English:

(147) Peter would believe that Mary is/was(were) pregnant.

The indicative may be zero mood in English just like present tense may be zero tense in German. In (145), mood is anaphoric, hence it has to be the zero mood interpretation which involves anchoring in doxastic worlds and not in the actual world. Mood is more liberal in English, and this is why the data in (146) is not robust.

For German, we can consider an example with a non-factive predicate *glauben*:

(148) Peter würde vielleicht glauben, dass Maria schwanger ist...

(148) has two readings. The first reading is a modal *de se* reading. We have seen that in German, indicative is zero mood at LF which means that it corresponds to the belief worlds (in contrast to Romance languages which often require a subjunctive in complements of attitudes, for instance). In this reading, the pregnancy is situated in the belief-world. The second reading is a *de re* reading. The indicative has to be evaluated with respect to the actual world. I propose that this corresponds to a factive reading: In other words, factive readings arise in embedded (non-asserted) clauses with indexical mood. This treatment of factivity will be presented in detail later. For the moment, just observe that what carries an *interpreted* indicative necessarily has to be evaluated with respect to the actual world. The two readings of (148) arise depending on whether we interpret morphological indicative as a zero mood or as an indexical mood. These two readings are compatible with an example like this:

(149) Wenn Maria mehr essen würde, würde Peter vielleicht glauben, dass sie schwanger ist.

Imagine two scenarios: The bound (zero) reading corresponds to a scenario where Maria is not pregnant but Peter might think that she is when she eats more. On the second reading, Maria's pregnancy is a fact in the utterance situation (as seen by the speaker), and Peter might finally believe her being pregnant if her belly grew. The two readings differ in whether mood is interpreted *de se* or indexically:

(150) Peter würde glauben, dass sie schwanger ist.

(151) $[_{MP}$ conj1 [Peter glaubt $\lambda 2$ $[_{MP}$ Ø Maria is pregnant]]] (de se mood)

(152) $[_{MP}$ conj1 [Peter glaubt $[_{MP}$ IND2 $[t_2$ Maria is pregnant]]]] (modal double access)

Note that in these examples with the attitude *glauben*, mood can always have the bound (zero) readings in addition to the indexical meaning. We will see that under factive predicates, this is not the case. This is why I assume that factive predicates do not bind embedded mood (and tense). Schlenker (2004) has to admit that the double access reading is not salient with attitudes. In order to illustrate modal double access readings, Schlenker (2004) uses *learn*, a predicate ambiguous between factive and non-factive in (154).

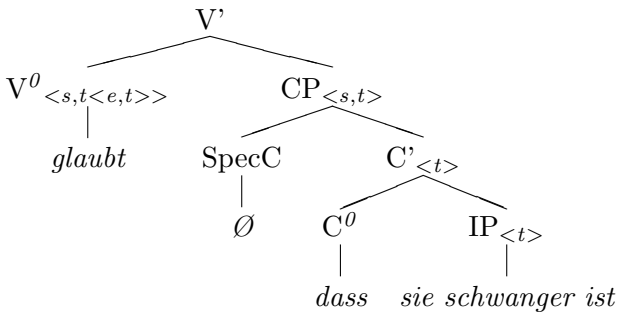
(153) If John learned that Mary was/were (now) pregnant, he would be devastated.

(154) If John learned that Mary is (now) pregnant, he would be devastated.
[Schlenker (2004), (31)a,b]

Clearly, with an attitude, data is less clear because the bound reading is much more salient. If we interpret the indicative mood indexically, then we will need to establish a counterpart relation between his belief content and the fact. This will be elaborated in section 3.1 corresponding to classical *de re* interpretations. Indexical readings under *believe* will be addressed in section 5.1.1.

In standard intensional semantics, it is generally assumed that the complements of attitudes are propositions. They are thus of type <s,t>, not of type <t>. It is well-known that when we interpret a clause embedded under an attitude, we have to type-shift the clause from <t> to <s,t>. An attitude s-selects for propositions.

(155)



What we do technically is to interpret mood and tense in the complement as if it were indexical. If a verb comes into life with a world (and tense) variable (being of type <s<e,t>>), as is standardly assumed, what we do technically is to interpret mood. The complement then is of type <t>. Then we assume a type shift and get the desired <s,t>. The basic idea of my proposal is that it is not by accident that we need to type-shift a complement under an attitude. We have to change the type from <t> to <s,t>. Why should that be the case? I argue that the assumption of a zero mood variable makes this assumption superfluous. If the object under an attitude contains a zero mood variable, we do not need a type shift. Intensional functional application (Heim & Kratzer, 1998, p. 108) can be covered by functional application if we take zero mood seriously. Why is there morphological mood and tense although they are zero mood and zero

tense? For the simple reason that the clause is finite ('tensed', see von Stechow, 1995).

Subjunctive

Subjunctive I under attitudes Under attitudes, often, the subjunctive I is used. It carries the presupposition that someone utters or believes a proposition. For this reason, it is often referred to as the *reportive subjunctive*. It may occur in root (156a, b) and in embedded contexts (157) but I will address only embedded contexts here.

(156) a. Anna sei schwanger.

b. Man nehme 500g Mehl und 2 Eier. Man mische beides unter kräftigem Rühren.

(157) Er behauptete, dass jemand das Auto angefahren habe.

Empirical data In my corpus study presented in section 2.2.2, I addressed only indicative clauses under attitudes. Now the subjunctive I data have to be addressed. In some prescriptive grammars of German (see for instance Jäger, 1971b), the subjunctive I is considered an obligatory mood in indirect speech. Probably, this is not seen dogmatically for attitude contexts. Von Stechow (1995) assumes that indicative present under attitudes is only a way to avoid the correct subjunctive form. For empirical reasons, this has to be qualified. Recall that in the results of the corpus study, I have only considered indicative cases up to this point. Thus, we have to address this issue here. Is subjunctive I obligatory in attitude contexts?

Before turning to my study, let me present data from Jäger (1971a). He did an empirical study on subjunctive I and II in indirect and non-indirect speech. I will focus on indirect speech here since non-indirect speech in his study covers optatives and irrealis comparison sentences. His text corpus comprises fictional texts, scientific literature, a report and newspaper texts. His results are summarized in Table 2.4.

His results indicate that subjunctive plays the most important role in complements of reported speech. Indicative seems to be marginal here.

I considered *glauben* and *denken* and not *verba dicendi* in general. However, both verbs are subsumed under predicates of reported speech in Jäger (1971b).

Table 2.4:

Embedded mood		Sentences	%
Indicative		544	13.0 %
Subjunctive I	unambiguous	2123	
	ambiguous	199	
	Σ	2322	55.6 %
Subjunctive II	unambiguous	1053	
	ambiguous	259	
	Σ	1312	31.4 %
		4178	100,0 %

In Table 2.5, I give the complete results for the sentences expressing simultaneity relations, including the subjunctive sentences.

Table 2.5:

Embedded mood		Sentences		
	indicative present	128		
	indicative past	32		
indicative			160	45.5 %
	subjunctive I	65		
	subjunctive II	63		
subjunctive			128	36.4 %
ambiguous betw. subj. I and ind.			64	18.2 %
			352	100.0 %

Since the subjunctive forms are impossible to tell apart in a corpus study (irrealis mood may be substituted for reportive mood if the reportive mood equals the indicative form, but in a corpus study it is impossible to tell when this happened; for details see Bech (1963), Lötscher (1991) and Fabricius-Hansen &Saebø 2004 , I subsumed them under one class.[11]

[11]This has one undesirable result. There are cases of speaker-counterfactual irrealis mood complements:

(i) Peter glaubte, dass Anna krank wäre.

The irrealis mood reflects the speaker's disbelief and is not part of the holder's belief. Hence, it is not a sign of semantic dependence, as may be argued for reportive mood, but of an effect very different from this (see section 2.2.3 for some details). This has to be kept in mind — however, it is impossible to identify these examples without doubt in the

In Jäger's results, indicative mood plays only a minor role (13%) while in my study, indicative is — if we consider the unambiguous forms — at least on a par with both subjunctive moods (45.5%). Admittedly, the total amount of sentences considered is much smaller in my study. This does not explain the divergences, though. How can we account for them? Firstly, again, this may be an effect which arises due to the predicates considered. *Verba dicendi* are probably more likely to be used with a subjunctive mood than attitude verbs. Secondly, there may be a diachronic effect. Buscha (1978, p. 70) and Starke (1985) mention that in reported speech, reportive subjunctive was standardly used. Jäger reports that there is a diachronic tendency to use indicative mood in reported speech in more recent texts. Since I will not go into the diachronic perspective here, we may at least conclude that subjunctive I and II occur in attitude contexts quite often but are far from obligatory. Hence, we have to find a way to explain both the indicative and the subjunctive cases. It is important to see that there is no mood selection in German like that of certain Romance languages which select for subjunctive mood under attitudes.

As mentioned, it follows from general considerations that mood in attitude contexts has to be bound, i. e. that there exists something like zero mood. I suggest that morphological indicative is a possible realization of zero mood. I will propose an analysis for subjunctive I which differs from zero mood and which accounts for the redundant but disambiguating effect of subjunctive I under attitudes.

Formal representation and analysis In this section, I present the formal analysis of subjunctive I as developed by Fabricius-Hansen & Saebø (2004) and show how their approach can be integrated into a *derived de se* account. In embedded contexts, the reportive subjunctive I is always optional. Fabricius-Hansen & Saebø (2004) note that the 'reportive presupposition' is sometimes redundant, when the assertion is embedded under a *verbum dicendi* as in (158).

(158) Peter berichtete, dass Maria schwanger sei.

corpus study. For this reason, I do not give a frequency for irrealis mood from part of the speaker. Jäger (1971b) assumes that its amount is about 12 % in all subjunctive II cases.

Sometimes this presupposition has to be accommodated. This is what happens in sentences like (159), where the matrix is negated.

(159) Niemand von uns glaubt, dass Anna schwanger sei.

Fabricius-Hansen & Saebø (2004) propose that the subjunctive in (159) might either be 'harmonic' (i. e. be triggered by the attitude without any semantic contribution) or the accommodation of a presupposition that someone else might have uttered/believed the embedded proposition. This is also the case in (160):

(160) Gleichzeitig bestritt sie, sie sei ein Mitglied der NSDAP gewesen.
[= Fabricius-Hansen & Saebø (2004)]

Fabricius-Hansen & Saebø (2004) give the following formal representation of the reportive subjunctive (RS):

(161) $\mathrm{RS}^* = \lambda\ \mathrm{K}\ \hat{}\mathrm{K}_{[\mathrm{x}—\Delta(\hat{}\mathrm{K})(\mathrm{x})]}$

Thus, according to Fabricius-Hansen & Saebø (2004), the reportive subjunctive has two functions. First, it turns the sentence into a proposition. Second, it introduces the presupposition that someone else has uttered (Δ) the proposition. In most embedded sentences, this presupposition is justified by the assertion. In these cases, the indicative does not differ much from the subjunctive I. When the presupposition carried along by the subjunctive has to be accommodated (as in intersentential justification like (162)), the subjunctive I differs from the indicative.

(162) Er dementierte nicht, Geishas für Liebesbeziehungen bezahlt zu haben, bestritt aber, dass das unmoralisch sei.
[= Fabricius-Hansen & Saebø (2004), (49)]

In (162), the assertion does not justify the presupposition, but it can find an antecedent in the intersentential context.

Fabricius-Hansen & Saebø (2004) give a mood-feature-deletion rule for subjunctive-under-subjunctive along the lines of von Stechow (1995). Subjunctive I can be anaphoric just like any other mood and tense:

(163) Sie sagte, sie schiesse, wenn er sich bewege.
[= Fabricius-Hansen & Saebø (2004), (57)]

It is not desirable to interpret the presupposition of the second subjunctive I: 'not only, that somebody says or has said that she shoots if he stirs, but

also, that somebody says or has said that he stirs' (p. 249). The zero mood deletion rule is:

(164) Zero mood: Delete a subjunctive in the scope of a subjunctive!
[= Fabricius-Hansen & Saebø (2004)]

Thus, morphological reportive subjunctive can be featureless at LF, and there is agreement for subjunctive I in German.

As has been stated by Fabricius-Hansen & Saebø (2004) (among others), reportive subjunctive complements can turn many predicates into *verbum dicendi* predicates which they normally are not. This holds for some emotive factives like in (165) and for an open class of predicates which conceptually allow the interpretation as *verba dicendi* (cf. (166) or (167)).

(165) Peter bedauerte, dass er krank sei. (emotive)

(166) Peter zischte, dass er krank sei.

(167) Peter schrieb einen Brief, dass er krank sei.

(168) ?Peter schämte sich, dass er krank sei. (emotive)

As there are many emotive factives which do not allow subjunctive I complements (for instance *schämen* in (168)), I assume that it is not their property of being an emotive factive but a more general meaning component which is responsible for this re-interpretation, for instance semantic similarity with communication predicates. Hence, (165) is parallel to cases like (166) and (167).

Overall, I agree with Fabricius-Hansen & Saebø (2004) and I would like to fit their observations into my framework.

In the bound cases, technically, the subjunctive will have to raise and give the default relation by the *derived de se* mechanism established above. This relation between worlds is again constituted by universal quantification over epistemic worlds. Thus, (169) will then be interpreted as in (170):

(169) Peter glaubt, dass Maria schwanger sei.

(170) [ind1 Peter berichtet [$\emptyset\lambda 2$ [Maria ist schwanger in t_2]]]

Since it only substitutes the default relation (which already involves universal quantification), the subjunctive is redundant here.

Since under attitudes, the most salient reading of the subjunctive I is the *derived de se* reading, subjunctive seems to be a logophoric mood. Subjunctive I cannot be interpreted other than *derived de se*.

Still, since a zero mood (in clauses with morphological indicative) is grammatical as well, we cannot talk about 'mood selection' in German. Therefore subjunctive I in German does not correspond to subjunctive in Romance languages, see Quer (1998) and Quer (2009). The German Subjunctive I is redundant, a fact which can be accounted for by a modal *derived de se* account.

My implementation does not differ much from Fabricius-Hansen & Saebø (2004), Schlenker (2003) and von Stechow (1984). The meaning Fabricius-Hansen & Saebø (2004) give for the reportive subjunctive (in (161)), as mentioned above, has two effects. First, it turns the sentence into a proposition. This is exactly what my *derived de se* mechanism does. Recall that if we interpreted mood, the complement would denote the extension of a proposition of type <t>. Instead, we need a proposition which is of type <s,t>. Subjunctive is not zero unless it is interpreted *derived de se*. It is a mood which denotes a subset relation between sets of worlds (universal quantification) and substitutes the default quantification brought along by the attitude. The second part is what Fabricius-Hansen & Saebø (2004) call the presupposition. I treat it as an overt pronoun which may be interpreted indexically or be bound. The world variable may also be free. It comes from someone else's reasoning that Anna is pregnant, thus, the world variable is interpreted indexically.

I propose that, generally, subjunctive I involves quantification over worlds restricted by a contextually given modal base. The subjunctive is neutral to the modal base — this is why I consider the term 'reportive subjunctive' misleading. The modal base can well be epistemic, but it can also be deontic/buletic or even circumstantial. This is why subjunctive I is used in so many different contexts including instruction contexts (see (156b)). The core meaning corresponds more or less to the meaning of the modal *sollen*. It involves quantification over a restricted set of worlds. In root contexts, we infer an epistemic modal base, and this is the reportive meaning. But we can also infer a deontic modal base in instructions or a reading in sentences like:

(171) *n* sei eine Primzahl.

(172) Anna sei meine Mutter!

In these case, we cannot tell whether it is buletic, deontic or circumstantial. It is a typical property of a contextual restriction that it depends on the

context and may have different interpretations. It is not restricted to contexts where the subjunctive entails that someone has uttered/believed the proposition but also occurs in desire contexts or deontic contexts:

(173) Er zwang sie dazu, dass sie still sei.

(174) Er wünscht sich, dass sie ihn lieb habe.

The subjunctive I shares this property with modals where the choice of the modal base depends on the context. Embedding under a matrix predicate imposes a modal base on a modal or on a subjunctive.

Fabricius-Hansen & Saebø (2004) note that the subjunctive I is a sign for non-factivity. This follows from my approach. Factivity is connected to the actual world. As subjunctive I involves quantification over possible worlds, it can never be factive because it never refers to the actual world. We will need to infer from the context in which worlds the proposition holds but we already know that it can never (only) be the actual world alone.

However, there is one difficulty that I inherit from Fabricius-Hansen & Saebø (2004) as well. It concerns the impossibility of first person subjects in sentences with attitudes and subjunctive I-complements:

(175) # Ich behaupte, dass ich unschuldig sei.

(176) Ich lüge in Bezug auf meine Haarfarbe und behaupte, meine Augen seien blau. [= Fabricius-Hansen & Saebø (2004), (44)a,b]

It is well-known that under certain conditions, subjunctive I under first person attitudes is possible, for example with past tense or explicit lying contexts. I will follow the explanation given in Fabricius-Hansen & Saebø (2004). An utterance like (175) is infelicitous only when the speaker wants to assert the embedded proposition. Assertion needs indicative mood for the speech act to be felicitous. To put it differently, the embedded proposition must not be under consideration for an assertion. This is supported by the fact that (175) is interpretable in particular contexts:

(177) A: Und was machst du, wenn sie dich erwischen?
B: Naja, ich behaupte, dass ich unschuldig sei.

Whenever the speaker is not committed to the proposition in his assertion, subjunctive I is grammatical in first person/present tense utterances.

Subjunctive II The irrealis mood, subjunctive II, fits into the picture as well. Subjunctive II is distributed in:

(i) conditional clauses (potentialis, irrealis)

(178) Wenn Peter in Berlin wäre, könnte er mir meinen Koffer mitbringen.

(ii) cases of counterfactuality or potentiality lacking an explicit conditional clause

(179) An deiner Stelle würde ich jetzt lieber gehen.

(180) Unter diesen Umständen hätte Peter sicher keine Zeit.

(iii) combination with a modal, with two readings:

(181) Das hätte ich nicht machen müssen. (ich musste das nicht machen, aber ich habe es gemacht)

(182) Das hätte ich machen müssen. (wenn ..., wäre es der Fall gewesen, dass ich es machen muss)

(iv) complement clauses to certain intensional predicates:

(183) Wir wünschen uns, dass er besser spielen würde.

(v) subjunctive II as a sign of politeness

(184) Mir läge sehr daran, das zu klären.

(vi) counterfactual consecutive clauses:

(185) Ich versuche über den Berg zu meditieren, aber da ist zu viel Nebel, als daß ich ihn sehen könnte.

(vii) counterfactual relative clauses:

(186) Noch habe ich aber mit niemandem gesprochen, der ihn gesehen hätte.

From this array of phenomena, I will only address (i) through (v).

I assume that subjunctive II mood has a core meaning which is irrealis. Being *irrealis*, subjunctive II carries the presupposition that the proposition follows from worlds excluding the actual world (for *potentialis*, the actual/matrix world is not excluded). In a conditional, the set of (non-actual) worlds is restricted with respect to the antecedent (Iatridou, 1991).

Following Fabricius-Hansen (1999), there are two main uses of the subjunctive II. In the default case, the world-parameter is shifted, it refers to counterfactual worlds. The second use, which I will not address here, is the subjunctive II as a substitute for subjunctive I in some contexts where the subjunctive I form is marked and replaced by the unmarked subjunctive II form (as a prescriptive rule; see for instance Jäger, 1971b, p. 27). Thus, these subjunctive II forms will be equivalent to subjunctive I. Furthermore, see Fabricius-Hansen (1999) for a more detailed description of the interaction of tense and mood.

Let me now consider the different readings of subjunctive II. In root contexts, we get quantification over counterfactual worlds (which are often restricted by a conditional).

(187) Peter wäre in Berlin (wenn er sich nicht in Maria verliebt hätte).

In embedded contexts, in analogy to tense, there are four possible readings of subjunctive II.

1. Subjunctive II may be anaphoric and agree in its morphological features. Since it is anaphoric, it does not carry any presuppositions.

   (188) Peter würde glauben, dass Maria schwanger wäre.

   As shown above, zero mood in German may also be expressed by indicative mood. Consequently, the subjunctive II is not obligatory in German:

   (189) Peter würde glauben, dass Maria schwanger ist.

   The semantic equivalence of (188) and (189) provides evidence for the claim that there is optional anaphoric zero mood under subjunctive II.

2. Mood may be relational. Kasper (1987a) notes that subjunctive II is ambiguous since the reported utterance (in the case of reported speech) or the belief content may itself contain the subjunctive II. Hence, we may

interpret the subjunctive II as embedded under epistemic quantifiation, i. e. as a relational operator. This corresponds to the backshifted temporal reading in past-under-present/past sentences. A suitable context is:

(190) Peter glaubt, dass Anna enttäuscht wäre (wenn er ihr keinen Antrag machen würde.)

In reported speech contexts, relational subjunctive II is preserved if transferred to direct speech.

(191) Peter sagte ihr, dass Anna die bessere Kandidatin wäre, wenn ihr Spanisch besser wäre. (indirect speech)

(192) Peter sagte: Anna wäre die bessere Kandidatin, wenn ihr Spanisch besser wäre. (direct speech)

Analogously, if the 'belief content' is reconstructed, subjunctive II interpreted as a relational operator has to be preserved as well:

(193) Peter dachte, dass Anna die bessere Kandidatin wäre, wenn ihr Spanisch besser wäre. (attitude)

(194) Peter dachte: Anna wäre die bessere Kandidatin, wenn ihr Spanisch besser wäre.

('belief content')

3. In the third reading, it is the *speaker* who considers the proposition to be counterfactual. Note that this is 'pure' counterfactual, non-conditional subjunctive II. The speaker considers the proposition to be counterfactual.

(195) Peter glaubt, dass Anna enttäuscht wäre. Ist sie aber gar nicht.

I propose that this is a modal *de re* reading. We have to interpret mood in the complement as indexical, i. e. take a *de re* interpretation of mood. We have to interpret the clause as if it were a root clause, interpret mood indexically, involving quantification over counterfactual worlds (as seen by the speaker). We then need a counterpart relation between the situation set in the denotation of the complement clause and Peter's doxastic alternatives. The interpretation should be parallel to a *de re* interpretation of tense in double access sentences. Still parallel with temporal

de re, the complement is of wrong type: <t> (or <i,t>, depending on whether or not we are ready to accept times independent from worlds).

(196) Peter glaubt, dass Anna enttäuscht wäre.

(197) Peter believes something which is counterfactual, (namely) that Anna is disappointed.

Since this *de re* interpretation of counterfactual mood raises many questions (counterpart relations are hard to formalize and the whole *de re* reading is impossible to paraphrase), I leave this to further research.

4. Subjunctive II may be *derived de se* under predicates which involve (epistemic) quantification over worlds excluding the actual world. In these cases, subjunctive II is optional — and redundant — under all predicates which entail counterfactuality of their complement.

(198) Peter wünschte sich sehr, dass Anna gesund wäre/ist.

(199) Peter stellte sich vor, dass Anna schwanger wäre/ist.

A *derived de se* reading is not accessible for *glauben* because *glauben* does not involve quantification over counterfactual epistemic worlds.

With a variable-reading of mood, we can interpret these uses of subjunctives and past tenses as bound by pragmatic operators which operate on the speech act level and give us information about the relevance or the conditions of an embedded speech act in the scope of subjunctive II.

Epistemic *sollen* under attitudes Besides subjunctive I, there are also *derived de se* readings of modals. Modals express relations between worlds. Similar to subjunctive I, the modal base has to be filled contextually. If the modal base is epistemic (and if the modal force 'fits' the embedding predicate), a modal with strong modal force behaves similar to subjunctive I in root contexts and in embedded contexts. With evidential *sollen*, in root clauses, it is presupposed that the source of the proposition is someone different from the speaker. This is similar to subjunctive I which — in root clauses — has the reading of an utterance made by someone other than the speaker.

(200) Peter soll ein ziemlicher Idiot sein.

(201) Peter sei ein ziemlicher Idiot.

In embedded clauses, evidential *sollen* is found under the following predicates (as reported by Schenner, 2007).

- Communication predicates: *behaupten, erzählen, berichten; hören, lesen*
- (Semi)factive predicates: epistemic *wissen, bekannt sein/werden, erfahren, erinnern*, emotive *interessant sein, seltsam sein, bedauern*
- Negative (denial/doubt) predicates: negative utterance predicates *abstreiten, leugnen*, negative epistemic predicates: *kaum/schwer zu glauben, nicht glauben können, bezweifeln*

Schenner (2007) presents three uses of reportive *sollen*:

- E type: embedded/assertive reading ('It is said that ϕ')

  (202) 90 mal 190 Zentimeter: Das waren die Abmessungen von Goethes bescheidenem Bett. Auf den Betrachter wirkt es heute ziemlich kurz, vor allem wenn er weiß, dass Goethe groß von Statur gewesen sein soll. [= Schenner (2007), (10)]

- G type: global/non-truth-conditional reading ('ϕ, as is alleged')

  (203) Daß er dem Schüler auch auf den Kopf geschlagen haben soll, streitet der Lehrer entschieden ab.
  [= Schenner (2007), (11)a]

- C type: concord reading ('ϕ', under communication predicates)

  (204) Es ist irgendwie kindisch, daß gleich behauptet wird, daß MS dahinterstecken soll.
  [= Schenner (2007), (12)]

In a presuppositional approach, reportive *sollen* carries the presupposition that someone uttered the proposition ϕ. Reportive *sollen* provides serious difficulties for a compositional approach. In a sentence like (205), what is claimed is not (in the most salient reading) that Anna is *said to be* pregnant but that she *is* pregnant. This is what Schenner (2007) calls the 'concord reading'.

(205) Sie behaupten, dass Anna schwanger sein soll.

In the global/non-truth-conditional type in (206), the presupposition that someone has uttered the proposition now becomes something like a conventional implicature in the sense of Potts (2005), i. e. an additional piece of information which is neither asserted nor presupposed. Thus, *sollen* may sometimes be embedded and sometimes it 'loses' its reportive content.

(206) Wir glauben nicht, dass es unmöglich sein soll, Soja und Gen-Soja getrennt zu liefern. (COSMAS: E96/AUG.19576)

This is very similar to subjunctive I under attitudes. In root contexts and embedded under factive predicates, the person parameter is shifted, while under attitudes, this is not necessarily the case. I assume that the mechanism is perfectly parallel: evidential *sollen* carries along a quantificational operator. It has to be interpreted in root contexts and under factive predicates, and involves a person shift in these cases. Under attitudes, it may substitute the default relation as provided by the attitude. This is the *derived de se* reading. The reportive/evidential content of *sollen* disappears since it changes the default relation as provided by the communication predicate. The *derived de se* reading requires that the embedding predicate binds mood and involves (evidential) quantification. This is why this reading is not available under factive predicates. As reported by Schenner, this E-type reading arises mostly under factive predicates and in root contexts.

Furthermore, *sollen* under attitudes may have a *de re* interpretation like in (206). This is similar to *de re* readings of subjunctive II under attitudes. Technically, the modal is moved to the matrix clause at LF. The reading can now be paraphrased by (207):

(207) Wir glauben nicht, was behauptet wird, nämlich dass es unmöglich sein soll, Soja und Gen-Soja getrennt zu liefern.

Summary: Subjunctive I and II Bound mood (and optionally tense) and epistemic quantification are the basic lexical ingredients of attitudes. Attitudes provide quantification over doxastic alternatives as their default relation with respect to the world variable. As this is the essential property of attitudes, indexical mood under attitudes is not possible. By a *derived de se* mechanism, the default relation can be replaced and be overridden by a modal relation without interpretive changes. This is the case with

subjunctive I (in a *de se* reading) and has the effect that subjunctive I is semantically redundant under attitudes. The subjunctive involves quantification which is redundant because the relation expressed is already part of the default relation provided by the lexical semantics of the embedded predicate. Some predicates are specified for doxastic worlds excluding the actual world, like *sich vorstellen* and *wünschen* and thus have *derived de se* readings with subjunctive II.

I have argued that German morphosyntactic indicative may always be zero mood at LF. Of course, it may be discussed whether indicative may be interpreted as a relational operator as well and express an identity relation between sets of worlds. In analogy with present tense, I assume that morphosyntactic indicative may either be interpreted as deictic, as relational operator or as zero mood. For simplicity, however, I assume that morphological indicative (present) can generally be interpreted as zero mood/tense at LF and does not require an analysis as a relational operator.

In sum, reportive subjunctive does not reflect an attitude on part of the speaker but involves quantification over worlds, and thus in attitude contexts has the effect of marking it as an attitude which is not the speaker's attitude. Embedded under an attitude (provided that the holder is not the speaker), complements marked with a subjunctive I are neutral with respect to the speaker's acceptance or denial of the proposition.[12]

Subjunctive II is a semantic mood which evaluates a proposition with respect to worlds different from the actual world. Besides anaphoric use, subjunctive II may be interpreted as a relational operator. I suggested that there is a *de re* reading of subjunctive II as well, in sentences like (208). Here, the irrealis mood is not part of the belief content but comes in as an additional piece of information on the part of the speaker.

(208) Peter glaubt, dass Anna die bessere Kandidatin wäre. Ist sie aber

[12]Depending on the context, this may have a pragmatic effect, which is that the speaker distances himself from the propositional content. I assume that this is a conversational implicature which arises with the subjunctive I in opposition to indicative mood. I became aware of this effect reading Steube (1983). She says that indicative mood marks the embedded proposition 'zusätzlich als wahr' since it may express the holder's acceptance. She relativizes this, claiming that the effect arises only in intentional opposition of different moods. Thus, if indicative mood is used in opposition to subjunctive I or II, it may have this effect of additionally expressing the speaker's acceptance. This is a conversational implicature.

gar nicht.

(209) Peter glaubt: Anna ist die bessere Kandidatin.

Similar to temporal double access readings, I suggest that it is possible to interpret the counterfactual mood *de re*, i. e. to move the subjunctive II feature at LF into the matrix clause. It is a belief about counterfactual worlds — as described by the speaker. The resul denotes a property of worlds and may be quantified over in analogy to zero mood complements.

2.2.4 Summary: Tense and mood under attitudes

In this chapter, I have shown that attitudes embed complements of different types. Depending of the interpretation of a pronoun, the complement may denote a proposition or a property of individuals. With respect to person, complements embedded under attitudes have three different interpretations. PRO only has a *de se* reading. An infinitival complement denotes a property of individuals. I have shown with Percus & Sauerland (2003a) that finite complements may contain pronouns which have a true *de se* reading. In order to derive this reading, we have to treat it like a relative pronoun and move it. I have argued that the pronoun is moved to a *concept* position at the left edge of the complement. This position is located in the scope of the attitude (i. e. is interpreted in a non-transparent position). In this position, the holder's self can be identified with the holder's self or it may be identified with an individual concept the holder bears a certin acquaintance relation to.

The lexical meaning of attitudes provides information about the default relation of person, tense and worlds. This suggestion has also been made by Hacquard (2006) for independent reasons.

With respect to tense, it has become a standard assumption that the complements of attitudes denote properties of times. The morphosyntactic tenses in complements under attitudes are not interpreted the way tenses in extensional contexts are interpreted. A temporal *de se* reading is easy to account for — the tense feature in the complement clause is not interpreted at LF. The complement denotes a property of times which fits the attitude's lexical semantics. The lexical semantics of attitudes provides information about default relations. For temporally neutral predicates, it is simultane-

ity[13]. There are inherently future-oriented predicates like *erwarten* which have posteriority as their default relation. There are no clear cases of predicates involving a default relation of anteriority. This default relation has to be 'taken over' by a zero tense complement. Second, a tense interpreted as a relational operator can substitue for the default relation, as shown for future under *erwarten*. This is the *derived de se* reading.

(210) Peter erwartet, dass Anna gewinnen wird.

The future tense is semantically redundant because it specifies the relation in a way the default relation is already specified by the lexical semantics of the predicate.

All temporal readings are summarized in table 2.6.

Table 2.6:

Tense	Interpretation	
present	zero tense	
		Peter glaubt/glaubte, dass Anna schwanger ist.
	indexical	
		(*in attitude contexts)
past	zero mood (anaphoric; marginal)	
		Peter glaubte, dass Anna schwanger war.
	de re	
		Peter glaubte, dass Anna früher Tänzerin war.
future	*derived de se*	
		Peter erwartet, dass Anna kommen wird.

For mood, the picture is quite similar. Under attitudes, morphological indicative mood has to be left uninterpreted at LF. Attitudes select for propositions, i. e. properties of worlds, thus the world variable has to be zero and is bound by the attitude. I assumed that indicative (present) in German is interpreted as zero mood without feature agreement with a mood in the matrix clause. In the same way with tense, mood may also be interpreted as a relational operator. This assumption is superfluous with indicative

[13]It might be possible to have a completely neutral temporal default relation, i. e. interpret belief contents as unspecified for tense. The holder may, in most cases, not even have any idea about the temporal restrictions of his belief content, it may be generic like tenseless present sentences. This is compatible with my account but hard to argue for without doubt.

mood but necessary for subjunctive II if the subjunctive II is part of the belief. Furthermore, there are *de re* interpretations of subjunctive II when the speaker marks a proposition which he ascribes an attitude holder as counterfactual. Additionally, there are *derived de se* readings where subjunctive II specifies a modal relation in a way it is already specified by the default relation provided by the attitude.[14] Subjunctive I usually has a *derived de se* reading under attitudes. Under the assumption that subjunctive I involves quantification over possible worlds with a contextually given modal base, it may replace the default relation of epistemic quantification as provided by the semantics of the attitude. Under this reading, subjunctive I under attitudes has to be redundant.

Mood	Interpretation
indic.	zero mood
	Peter glaubt/würde glauben, dass Anna schwanger ist.
	relational operator
	Peter glaubt, dass Anna schwanger ist.
	indexical
	(*in attitude contexts)
subj. II	zero mood (anaphoric)
	Peter würde glauben, dass Anna schwanger wäre.
	relational operator
	Peter glaubt, dass Anna glücklich wäre (wenn...).
	indexical/*de re*
	Peter glaubt fälschlicherweise, dass Anna Tänzerin wäre.
	derived de se
	Peter stellt sich vor, dass Anna schwanger wäre.
subj. I	*derived de se*
	Peter glaubt, dass Anna schwanger sei.

To be precise, *derived de se* readings are in fact special cases of tenses and moods. This special relational operator will be semantically redundant if it corresponds to the default relation as provided by the lexical semantics of the embedding predicate.

The assumption that *de se* complements denote properties, is an idea

[14]Of course, there may be *derived de se* readings of the indicative as well, but this neither has interpretatory effects nor any effect visible at PF.

that goes back to Lewis (1979). In this thesis, I showed that complements may be interpreted as properties of times, properties of individuals, and properties of worlds, i. e. propositions. I assume that *de re* interpretation is LF movement which turns the denotation of a complement into a property as well. Hence, the semantic type of an attitude complement is <e,<i<s,t>>>.

2.3 Influence predicates

There is another predicate class closely related to attitudes, namely *influence predicates*. This predicate class is, in the words of Bonevac less 'philosophically exciting' than attitudes (Bonevac, 1984, p. 187). Still, they are worth considering and one key observation of this thesis will come from influence predicates. In my analysis, the essential property of attitudes is that they bind the world variable of their complement and involve epistemic quantification. Influence predicates share this property of bound mood but differ in the modal base for the quantification. We will see in the following sections that there are many epiphenomena that come up with influence predicates that we are acquainted with from the investigation of attitudes. Again, mood has to be bound, and again we will have to deal with default relations between worlds. Influence predicates involve (intensional) causation. For example *dazu zwingen, den Präsidenten zu ermorden* 'force to kill the president' may have different truth values depending on the extension of *Präsidenten*. My claim is that they are the root modality counterparts of attitudes.

Generally, influence predicates are predicates which describe an influencing factor who influences a patient in order to make him perform some action. This verb class corresponds to the class of 'influence predicates" in Sag & Pollard (1991) from whom I borrowed the term.

Influence predicates give a causal relation between a source (influencer) and a result (influencee and action). I will show that the result can be analyzed as a modalized proposition. If we assume that with modal predicates as in (211), the influencer is in the background[15] while the result, for exam-

[15]See Öhlschläger (1989):

> Die Quelle, also der Faktor, der das Eintreten des mit der IP bezeichneten Sachverhalts notwendig macht, wird nur teilweilse, nur relativ selten sprach-

ple *arbeiten können*, is in the foreground, this is the opposite for influence predicates. With the influence predicate in (212), the influence is in the focus while the result is backgrounded.

(211) Peter kann arbeiten.

(212) Anna ermöglicht Peter zu arbeiten.

The class of influence predicate which I address here is an extension of the class of *if*-verbs in Karttunen (1971b). In the following lines, I give his definition which will be extended later for my purposes. The examples of Karttunen are given in (213) to (214):

(213) John forced/made/caused Mary to stay home. (*if*-verbs)

(214) John ordered/asked/advised Mary to stay home. (no *if*-verbs)

While in (213), the speaker is committed to the truth of the entailment, he is not in (214).

The second characteristic of *if*-verbs is their behavior under negation. When the matrix is negated, nothing follows from the complement:

(215) Er zwingt sie nicht dazu, das Auto zu verkaufen. $\nrightarrow$ Sie verkauft das Auto (nicht).

I will present an analysis which accounts for these facts and makes it possible to further integrate predicates like in (214). We will see that with one additional assumption, they can be treated analogously.

I assume that there are different types of influence predicates. First, there are predicates expressing that someone is influenced in order to perform an action with a high degree of probability, i. e. *zwingen*. It is entailed that the action is performed, cf. (216) which entails that the influenced person performs the action to sell the car.

(216) Er zwingt sie dazu, das Auto zu verkaufen.

Predicates like *zwingen* can be analyzed as causative predicates. They surely are predicates which involve an influence on a patient. Additionally, there are other predicates which entail just that there is a certain influence on a

lich realisiert — entweder durch die explizite Angabe wie in praktischen Schlüssen [...] oder durch Präpositionalphrasen [...].

(Öhlschläger, 1989, p. 144)

patient. *Befehlen* in (217) does not entail that the action is performed but implies that an obligation is put on the patient. This can be considered a similar effect — as obligation imposed on someone is also an influence on a patient. The similarity can be accounted for if we consider predicates like *zwingen* as influence of strong modal force with dispositional modal base and the obligation predicates as influence with strong modal force and a deontic modal base. An example is given in (217).

(217) Er befiehlt ihr, das Auto zu verkaufen.

In (217), it is not the performance of the action referred to in the complement which is entailed but the fact that an obligation is imposed on the patient. The entailment can be paraphrased by modal expressions like in (218) and (219).

(218) Er zwingt sie dazu, das Auto zu verkaufen.
→ Sie muss das Auto verkaufen.

(219) Er befiehlt ihr, das Auto zu verkaufen.
→ Sie soll das Auto verkaufen.

In a Kratzerian analysis of modality, dispositional modality has an empty ordering source. *Befehlen* 'command' carries deontic modality with an appropriate ordering source. Both dispositional and deontic modality can be subsumed under circumstantial or root modality. There are also buletic circumstantial predicates which will be addressed later. All variants of circumstantial modality express necessarity and possibility in the real world (Kratzer, 1991).

Are there influence predicates which express possibility? I assume that a predicate like *ermöglichen* 'enable' can be treated in analogy to the predicates we have dealt with above. Instead of necessity they are predicates of possibility. There are dispositional predicates like *ermöglichen* 'enable' and deontic predicates like *erlauben* 'allow'. The following entailments can be given in analogy to (218) and (219).

(220) Er ermöglicht ihr, das Auto zu verkaufen.
→ Sie kann das Auto verkaufen.

(221) Er erlaubt ihr, das Auto zu verkaufen.
→ Sie darf das Auto verkaufen.

The difference between necessity and possibility is that with the necessity modal, the expression *must p* is true iff *p* is true in all the worlds selected by the modal base (that are best with respect to the ordering source) while *can p* is true iff there is at least one world (one of those which are best with respect to the ordering source).

The distinction corresponds in principle to an idea by Koenig & Davis (2001). They propose that not only true causatives can be accounted for by a causation relation but also predicates like *force* and *promise*. This is due to the fact that there is sublexical modality which requires the selection of a modal base just like lexical counterparts of those predicates (modal auxiliaries) require a modal base. This is exactly what I propose.

Karttunen (1971b) introduces another class quite similar to *if*-verbs, namely *only-if*-verbs. *Only-if*-verbs are *can, be able, possible, be in the position*. These predicates stand out due to their property that we cannot draw conclusions with respect to the truth of the complement in the affirmative case. In negated sentences, though, the complement will always be false:

(222) Peter kann die Waschmaschine reparieren.
→ Peter repariert die Waschmaschine *oder*
→ Peter repariert die Waschmaschine nicht.

(223) Peter kann die Waschmaschine nicht reparieren.
→ Peter repariert die Waschmaschine nicht.

If we analyze *only-if*-verbs as influence predicates involving a sublexical possibility modality, we can account for these facts as well.

Table 2.7: Modal logic

possible		
necessary	contingent	impossible
	not necessary	

Something which is possible, is either necessary or contingent (see Table 2.7). Thus, we do not know whether it is true or not. In the case of negated possibility, we can tell, because something which is impossible will not be true.

Let us have a look at necessity predicates. The modal analysis accounts for the fact that we can only give the entailment in the cases of affirmative matrix. Something which is necessary will be true. But something that is not necessary is either contingent or impossible, thus we cannot tell. This is why *only-if* verbs and *if*-verbs follow the same pattern of modal logic. So Karttunen (1971b) overlooked the inner connection between the two cases which can be accounted for if we assume an underlying modal analysis. There is always a conclusion which can be drawn from an affirmative sentence with an influence predicate. It may not concern the facts in the actual world, but it concerns dispositional worlds which are accessible from the actual world. *If*-verbs fall out as a special case of influence predicate. It is predicates which leave only one possible conclusion (i. e. *necessary p* or *impossible p*) with a dispositional modal base. With these predicates, we make statements about the truth of the complement, i. e. they are *if*-verbs.

(224) Peter zwingt Anna einzukaufen.
→ Anna muss einkaufen. (necessary)

(225) Peter zwingt Anna nicht, einzukaufen.
→ Anna [muss nicht] einkaufen. (contingent or impossible)

(226) Peter ermöglicht Anna einzukaufen.
→ Anna kann einkaufen. (necessary or contingent)

(227) Peter ermöglicht Anna nicht, einzukaufen.
→ Anna [kann nicht] einkaufen. (impossible)

The same pattern can be given for deontic influence predicates.

Table 2.8: Modal logic

	permissible		
obligatory	optional	impermissible	
		gratuitous	

(228) Peter befiehlt Anna einzukaufen.
→ Anna soll einkaufen. (obligatory)

(229) Peter befiehlt Anna nicht, einzukaufen.
→ Anna [soll nicht] einkaufen. (optional or impermissible)

(230) Peter erlaubt Anna einzukaufen.
→ Anna darf einkaufen. (obligatory or optional)

(231) Peter erlaubt Anna nicht einzukaufen.
→ Anna [darf nicht] einkaufen. (impermissible)

Karttunen (1971b) introduces the classes of negated *if*-verbs and of negated *only-if*-verbs. These can be included here as well. His example of a negated if-verb is *prevent*. I will use German *abhalten* as a prototypical example.

(232) Peter hält Anna davon ab einzukaufen.
→ Anna [kann nicht] einkaufen. (impossible)

(233) Peter hält Anna nicht davon ab einzukaufen.
→ Anna kann einkaufen. (necessary or contingent)

The inherently negated *if*-verb behaves like matrix-negated possibility predicates (cf. (226) and (227)). A deontic negated *if*-verb is *verbieten*, and again, the pattern is the same (cf. (230) and (231)).

(234) Peter verbietet Anna einzukaufen.
→ Anna [darf nicht] einkaufen. (impossible)

(235) Peter verbietet Anna nicht einzukaufen.
→ Anna darf einkaufen. (necessary or contingent)

2.3.1 Mood and tense

Hence, influence predicates can be accounted for in terms of modal logic. Tables 2.9 and 2.10 show the behavior of influence predicates depending in the modal force, modal base and affirmation/negation.

Table 2.9: Dispositional logic

Example	affirmative		conclusion	negated		conclusions
zwingen	$\Box p$		necessary	$\neg\Box p$	$= \Diamond\neg p$	uncertain
abhalten	$\Box\neg\ p$	$= \neg\Diamond p$	impossible	$\neg\Box\ \neg p$	$= \Diamond p$	uncertain
ermöglichen	$\Diamond p$	$= \neg\Box\neg p$	uncertain	$\neg\Diamond p$	$= \Box\ \neg p$	impossible
??	$\Diamond\neg\ p$	$= \neg\Box\ p$	uncertain	$\neg\Diamond\neg p$	$= \Box p$	necessary

Formally, influence predicates are quantifiers with a deontic or dispositional modal base. This means that, for example, if Anna is allowed to go

Table 2.10: Deontic logic

Example	affirmative		conclusion	negated		conclusion
befehlen	Op		obligatory	$\neg Op$	$= P\neg\ p$	uncertain
verbieten	$O\neg p$	$= \neg$ P p	impermiss.	$\neg O\neg p$	$= Pp$	uncertain
erlauben	Pp	$= \neg O\neg\ p$	uncertain	$\neg Pp$	$= O\neg p$	impermiss.
abschlagen[16]	$P\neg p$	$= \neg Op$	uncertain	$\neg P\neg p$	$= O\ p$	obligatory

shopping, every world in which she goes shopping is compatible with the world where she follows her obligations. For dispositional influence predicates it means that if Anna is forced to go shopping, her going shopping follows from all worlds on the basis of her dispositions (including the influence of the causer). The quantifier and the modal base are part of the lexical semantics.[17]

(236) Peter befiehlt Anna, einkaufen zu gehen. (deontic)
Peter cause λw [$\forall w'$ ($w' \in W_{deon}(w) \rightarrow$ Anna goes shopping in w')]

(237) Peter bringt Anna dazu, einkaufen zu gehen. (dispositional)
Peter cause λw [$\forall w'$ ($w' \in W_{circ}(w) \rightarrow$ Anna goes shopping in w')]

(238) Peter rät Anna, einkaufen zu gehen. (deontic)
Peter cause λw [$\exists w'$ ($w' \in W_{deon}(w) \wedge$ Anna goes shopping in w']

(239) Peter ermöglicht Anna, einkaufen zu gehen. (dispositional)
Peter cause λw [$\exists w'$ ($w' \in W_{circ}(w) \wedge$ Anna goes shopping in w']

In this respect, influence predicates are very similar to attitudes. Instead of epistemic modality, it is root modality which is involved here (plus causation).

The 'ideal' complement does not have indexical mood/tense but a zero mood/tense which is bound in the way described here.

[16] Suggested by M. Reis (p.c.).

[17] In Rau (2009), I call this 'Erweiterte Modalübertragung'. This goes back to an approach by Fabricius-Hansen & v. Stechow (1989) who observe that in many CP complements to nominals, we have to insert a mood feature in order to interpret the sentence:

(i) Die Möglichkeit, dass Ede Professor wird, ist erfreulich.
Die Möglichkeit dass Ede Professor werden *könnte*, ist erfreulich.

Modal verbs in complements of influence predicates

We know from our observations on attitudes that finite complements may well contain zero mood and zero tense. We would expect them to be interchangeable with infinitives then, an assumption which is borne out:

(240) Peter befiehlt Anna, Butter zu kaufen.

(241) Peter befiehlt Anna, dass sie Butter kauft.

The starting point for this section is the observation that quite often, we find modal verbs in finite complements under influence predicates:

(242) Peter befiehlt Anna, dass sie morgen Butter kaufen soll.

(243) Peter cause λw [$\forall w'$ ($w' \in W_{deon}(w) \rightarrow$ Anna goes shopping in w')]

Parallel to epistemic modals under attitudes and to overt future tense under *erwarten*, a compositional interpretation runs into trouble here. If the semantics of *befehlen* involves quantification over deontic worlds, how should the modal be interpreted? Do we have to quantify twice? The first idea one may have (similar to 'harmonic subjunctive') is a modal concord approach (cf. Geurts & Huitink, 2006). Although this is a reasonable idea, there is evidence that it is not correct. If they were modal concord (or harmony) elements, they should be allowed both in infinitival and in finite complements. As the remainder of this section shows, this is not true.

Let us have a look at infinitival complement clauses embedded under a deontic predicate:

(244) Er befiehlt ihr zu arbeiten.

(245) *Er befiehlt ihr arbeiten zu sollen.

(245) shows that the modal *is* interpreted, leading to ungrammaticality. On the view that modal auxiliaries are modal concord markers, (245) should be grammatical. (According to my knowledge, this is mentioned by Engelen (1975) for the first time.) Recall that in the finite complement in (246) the deontic auxiliary is grammatical.

(246) Er befiehlt ihr, dass sie arbeiten soll.

(247) *Er soll arbeiten sollen.

(248) Er muss arbeiten müssen.

I assume, in a nutshell, that this is because the modal is interpreted twice in infinitival complements and only once in finite clauses. The following test strongly supports this. Why should it be ungrammatical to interpret both the implicit and the overt modal in (245)? Castañeda (1970) reports that iteration of modality is not allowed in the case of *sollen* while it is possible — despite though redundant — for other modality types (cf. (247) vs. (248)). I will not go into the question of why iteration of deontic *sollen* is ungrammatical since this has to be explained in deontic logic. But the observation serves as a helpful test in order to see whether overt modals are interpreted in addition to the implicit modal or not. It will be shown that it reveals a difference between finite and non-finite complements.

Why should it be the case that we must not insert the modal into infinitival clauses? In fact, this already follows from my proposal. The crucial difference between non-finite and finite clauses is the fact that infinitives lack mood just as they lack tense. This means that their zero mood variable obligatorily has to be bound by the binder index the control predicate provides. There are no *derived de se* readings in non-finite complements because infinitival complements are entirely featureless with respect to mood. Recall that I assumed that attitudes provide a binder index for mood which — by virtue of the lexical semantics of the predicate — shifts or quantifies over the zero world variable.

(249) Peter believes that Mary goes shopping.

(250) Peter believes $\lambda 1$ [ØMary goes shopping]

(251) [[Peter believes that Mary goes shopping]]= λx λw for all $w' \in \mathrm{DOX}_{Peter,w}$, Mary goes shopping in w'.

For the deontic influence predicate *befehlen*, the semantics is correspondingly:

(252) Peter obligates Anna to go shopping.

(253) Peter obligates Anna $\lambda 1$ [ØMary goes shoppings]

(254) [[Peter obligates Anna to go shopping]]= $\lambda x\ \lambda w\ x$ causes that for all $w' \in W_{deontic,Peter}$, Anna goes shopping in w'.

Modal verbs in finite complements are interpreted (and then are interpreted *derived de se*). Zero mood in infinitival complements is not, so we can parallel these cases to the observation that PRO does not have a *derived de*

se reading as well and is always interpreted *de se* since it is bound by the default binders provided by the embedding predicate. Since there is simple zero mood in infinitival complements, we do not apply a movement mechanism which is able to 'neutralize' a modal by mapping it with the default relation. We have to interpret everything in the clause, and this leads to illicit iteration.

Why are finite complements different? I have argued that finite complements under influence predicates without an overt modal verb are always interpreted *de se* because indicative has to be interpreted as zero mood in these cases. The complement is interpreted modally quantified.

(255) Peter zwingt Anna dazu, dass sie hingeht.

(256) Peter causes for Anna that all of her deontic worlds w' are such that she goes shopping in w'.

Formally, I treat influence predicates on a par with future-oriented predicates (ignoring person).

(257) Peter zwingt Anna/sie$_i$ PRO$_i$ auf die Party zu gehen/dass Anna auf die Party geht. (zero mood, zero tense)

(258) [Peter zwingt Anna dass 1 2 [$_{MP}$ Ø[$_{TP}$ ØAnna geht auf die Party]]]]

(259) $[\![$zwingt dass Anna auf die Party geht$]\!]_g$ = λt. λw. For all <w',t'> in DEON$_{Anna,w,t}$, Anna goes to the party in w' at in t'.

Ignoring tense for a while, the modal *derived de se* sentence will have the LF and truth conditions as proposed here:

(260) Peter zwingt Anna dass Anna auf die Party gehen muss. (*derived de se mood*)

(261) [Peter zwingt Anna dass [DEON [λ1 [Anna geht auf die Party in t_2]]]]

(262) $[\![$[Peter zwingt dass Anna auf die Party gehen muss$]\!]_g$ = λw. For all w' in $W_{cause\,Peter,Anna,w}$, Anna goes to the party in $w'\in$ DEONAnna,w.

If all finite clauses carried zero mood as well, (263) should be ungrammatical as well. But this, obviously, is not the case.

(263) Peter befiehlt Anna, dass sie die Türe schließen soll.

This means that only modals in finite complements can be interpreted *derived de se*. The modal is marked with an indicative which probably has to be interpreted as a relational operator — a possibility which does not exist for 'pure' zero mood. Only in the finite clause may the relation between worlds be redundant, and I have suggested the movement *derived de se* approach borrowed from Percus & Sauerland (2003a). Just like epistemic modals or subjunctive I and II involve a *derived de se* interpretation of mood (see subsections in 2.2.3), deontic modals receive a *derived de se* interpretation with the overt modal. The sentence may be paraphrased as 'What Peter causes about Anna's deontic worlds is that they are worlds where she goes shopping'. For deontic predicates, the ungrammaticality of overt modals reveals that finite clauses have a *derived de se* reading which is unavailable for infinitival complements.

That this is true for dispositional modals under dispositional influence predicates as well can by proved by frequency studies. Generally, modal verbs are quite frequent in finite complements under influence predicates and very infrequent in non-finite complements. This generalization holds both for deontic and dispositional predicates (although iteration of dispositional modality is only redundant, not illicit). First, see Table 2.11 for the frequencies of finite and non-finite complements under influence predicates in COSMAS.

Table 2.11: Finite and non-finite complements under influence predicates

mod. base	mod. force	verb	Items	fin. %	non-fin. %
dispos.	necessity	*zwingen*	268	0.4	99.6
		nötigen	301	1.3	98.7
		abhalten (neg.)	1116	0.1	99.9
	possibility	*ermöglichen*	213	69.9	90.1
		erschweren (neg.)	118	5.9	94.1
deontic	necessity	*befehlen*	224	6.5	93.5
		verbieten (neg.)	2794	7.9	92.1
	possibility	*erlauben*	23703[18]	2.9	97.1
		abraten (neg.)	409	0.5	99.5

[18]Interpolating from the number of finite and non-finite cases in a random sample of suitable size.

In this COSMAS study, sentences containing redundant modals were counted and related with the total amount of sentences containing the same predicate. Table 2.11 gives the results for redundant modal verbs in finite and non-finite clauses. It is obvious that redundant modal verbs are much

Table 2.12: Modal verbs in finite and non-finite complement clauses

Verb	modal verb (MV)	sentences incl. MV in fin clauses (%)	sentences incl. MV in infin. clauses (%)
nötigen	müssen	50.0	0.3
ermöglichen	können (dürfen)	33.3	2.6
befehlen	sollen	75.0	0.0
erlauben	dürfen (können)	14.9	0.5
verbieten	dürfen/können	2.3	0.0

more frequent in finite clauses — a fact which can only be accounted for if we assume differences between the interpretation of finite and non-finite clauses. The modal concord approach conflicts with these observations. If we assume a *derived de se* mechanism for finite clauses these results can be explained. Only in infinitival clauses, the modal *has* to be interpreted.

For some matrix predicates, *derived de se dass*-clauses are more frequent than *dass*-clauses without a modal (e. g. *nötigen*, 50% of the finite complements within modal verb, *befehlen* 75%). This means that for some predicates, the *derived de se* complement clause is preferred to a simple (zero) finite complement clause.

Dass-clauses and infinitival clauses in principle are substitutes for each other because tense and mood in both finite and non-finite clauses under influence predicates are interpreted as bound variables (see chapter 5.1.2 for important exceptions). The data provide evidence for the claim that only in finite complements, modals may receive a *derived de se* interpretation, leading to a higher rate of modal verbs in their complements.

Besides dispositional and deontic modal bases, there may also be a buletic modal base[19]. I suggest this on the basis of buletic modal verbs

[19]A side remark: Often desideratives are assumed to form a natural class, and this is probably right when we look at the desiderative part of the lexical semantics only. Desiderative predicates involve some kind of wanting, desire, or intention. But how do they fit into my classes with respect to complementation? Up to this point, I have excluded

in complements under predicates like *planen, entscheiden, sich vornehmen*:

(264) Peter plante, dass er im Sommer umziehen wollte.

(265) Anna entscheidet, dass sie ihr Studium nicht abbrechen will.

There are readings in which the modal verbs are semantically redundant. This is clear when we compare these sentences with the infinitival complements including a buletic modal:

(266) Peter plante, im Sommer umziehen zu wollen.

(267) Anna entscheidet, ihr Studium nicht abbrechen zu wollen.
= Anna entscheidet, dass sie nicht will, dass sie ihr Studium abbricht.

For buletic predicates, we seem to be more 'tolerant' towards modal doubling. Note that the fact that in some infinitival complements there are redundant modal verbs does not weaken my analysis. The claim I am making is based on two crucial observations. The first observation is that there are never redundant modals under deontic necessity predicates like *befehlen* — any other types of modality do allow for serialization and do not yield ungrammatical results. Note that this does not hold for CP-complements to nominal projections. Stowell (1981) assumes that *that*-clauses under nominals can be modifiers, for this reason, even *sollen* is licit under the nominal *Befehl*:

(268) Er bekam den Befehl, dass er die Küche fegen soll/die Küche fegen zu sollen.

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desideratives like *planen* 'plan', *vorhaben* 'plan', *sich entscheiden* 'decide', *sich vornehmen* 'undertake', *versuchen* 'try', *anstreben* 'aim for' (except for *versprechen* 'promise' which has a desiderative flavour, and *versuchen* 'try' which probably is not propositional). Still, they may be integrated here as well. But we will have to give up the idea of a natural class of desideratives. Desideratives can be found in all of my classes. I assume that intention is a factor which may play a role within all predicate classes but in different ways. There are desiderative intensional predicates *befürchten* 'be afraid' (doxastic) or *entscheiden* 'decide' (circumstantial/root), desiderative implicative predicates like *versuchen* 'try' and in some way also desiderative factive predicates (*wertschätzen* 'appreciate' and *froh sein* 'be glad'). Each one will be investigated in its predicate class. See, for instance, the contrast between *sich vornehmen* 'undertake' and *vorhaben* 'plan'.

(i) Peter nimmt sich vor, dass er umziehen will.

(ii) *Peter hat vor, dass er umziehen will.

Sich vornehmen 'undertake' seems to be an influence predicate, while *vorhaben* 'plan' is not.

Second, it becomes clear from the results that there is a difference between the frequency of redundant modals in finite complements versus redundant modals in non-finite complements. It is this difference which provides evidence of the fact that the interpretation of modals in finite clauses differs from their interpretation in infinitival clauses.

2.3.2 Tense in influence complements

Tense in complements under influence predicates is bound by the lexical binder provided by the influence predicate:

(269) CAUSE $\lambda t\ \lambda w'\ [\forall w'' \in W_{root}(w') \rightarrow p(w'')(t)]$

(270) Peter befiehlt Anna $\text{DEON}_2\ \emptyset_1$ Ø-soll(t_1)(t_2) $\lambda_2\ \lambda_1$ Anna soll das Buch zurückgeben(t_1)(t_2)

The interplay of tense and mood in modal *derived de se* complements is interesting. In (271), I assume that both tense and mood are zero. Zero tense is bound by the implicit modal. Due to the zero tense, the embedded tense denotes the *de se* tense which means that it is the interval simultaneous to the *zwingen*-event which is in the past in this example. In (272), the modal is tenseless and is interpreted modally *derived de se*. What about (273)?

(271) Peter zwang Anna dazu, dass sie einkauft.

(272) Peter zwang Anna dazu, dass sie einkaufen muss.

(273) Peter zwang Anna dazu, dass sie einkaufen musste.

(274) *Peter zwang Anna dazu, einkaufen gemusst zu haben.

(273) is not perfectly well-formed, but it is certainly much better than (274). This means that the past feature in (273) cannot be interpreted relatively, because this holds also for the ungrammatical infinitival complement in (274).

Let me address frist the question of whether complements under influence predicates are tensed or not.

In the literature, it has been debated whether complements under predicates like *decide* involve a temporal domain or not.

According to the analysis of Stowell (1982), there are two classes of infinitival complements. Irrealis infinitives denote unrealized events, while in propositional infinitives, the complement is free in its temporal denotation.

Stowell concludes that propositional infinitives are tenseless and irrealis infinitives have a tense-operator which is 'unrealized' or 'possible future' (cf. Bresnan, 1972). This property distinguishes them from English gerunds which lack a tense operator. It follows from the work on tense under attitudes that propositional complements contain zero tense. This holds for infinitival complements as well. What is 'possible future'?

It follows naturally from (269) that the caused result state can only be situated after the causation event. This is captured if the modal binds the tense variable. This gives us the right predictions for cases investigated by Wurmbrand (2001). Example (275) is possible with the past modifier because the matrix predicate embeds a propositional or factive infinitive, while (276) with an irrealis infinitive as the complement is not[20]:

(275) Hans hat behauptet/bedauert gestern/vor zwei Tagen Kirschen gegessen zu haben.

(276) *Hans hat beschlossen/geplant gestern/vor zwei Tagen zu verreisen.

Wurmbrand (2001) generalizes that irrealis infinitives are always incompatible with a past modification. She concludes that 'this observation follows naturally since irrealis infinitives by definition of Stowell (1982) involve future tense'.

If tense is bound by the lexical semantics of the predicate, and this involves modalization, the future-orientation of the complements follows from that. Trivially, the event time in a complement under an influence predicate has to follow the 'causing' time:

(277) *Peter zwingt Anna dazu, dass sie arbeitete.

According to von Stechow (2005) and Condoravdi (2002), modals extend the evaluation time into the future and predicate the (modalized) proposition of this time interval. This is a formalization of the term 'possible future'. In this way, influence predicates are incompatible with anteriority

[20]Furthermore, Wurmbrand 2001 argues that infinitival tense is relative while finite tense is absolute as illustrated in (i). This distinction corresponds to bound vs. indexical tense. For English, the first sentence cannot contain a bound tense because the anaphoric form would be *would* instead of *will*.

(i) Leo decided a week ago that he will go to the party (*yesterday).

(ii) Leo decided a week ago to go to the party yesterday. [=4a,b]

and the ungrammaticality of influence predicates and with perfect infinitival complements is explained:

(278) *Peter zwang Anna dazu, Suppe gekocht zu haben.

But why are (279) and (280) acceptable?

(279) Peter befahl Anna, dass sie Suppe kochen sollte.

(280) Anna ermöglichte Peter, dass er die Suppe auslöffeln konnte.

We cannot interpret tense as bound under the modal (because infinitival complements should be possible then). The embedded past tense might be an anaphoric tense. If this is true, similarily, subjunctive II should be interpretable if anaphoric:

(281) Peter würde Anna ermöglichen, dass sie die Suppe auslöffeln können würde.

Example (281) seems to be grammatical (but hard to understand). If (281) is grammatical, (279) and (280) might be temporal analogies to (281); the embedded tense is anaphoric and thus is interpreted as zero tense at LF. Hence, it is not interpreted anterior to the matrix event.

As a second possibility, tense and mood in cases like (279) and (280) might be interpreted indexically. It should be presupposed in (280) that Peter could eat up the soup and it is asserted that Anna enabled him to do so. We will see later that presupposed readings are compatible with influence predicates. I will, at this point, leave this issue because the sentences are marginal and hard to judge.

2.4 Summary

I have shown that semantically, complements under intensional predicates have to meet certain selectional requirements. Complements under attitudes usually carry zero mood and tense which is bound by the lexical binder provided by the matrix predicate. Attitudes and influence predicates form a natural class of intensional predicates. The class characteristic is that they bind mood and tense in their complement and that there are default relations.

Binding of tense, mood and person follow the same general principles across both predicate classes. Predicates differ in the temporal and modal relations they provide due to their lexical meaning.

If a zero (tense, mood) complement is combined with an intensional predicate, we get the *de se* interpretation. I established that an attitude provides lexical binders and that the lexical entry contains information about the default relations between individuals, times and worlds in this *concept*. The bound mood, tense and/or person variable are zero in the complement and are bound by the lexical binder provided by the control predicate. Zero variables obligatorily take over the default relation. This is because they are bound by the lexical binder. For the individual domain, this means that *glauben* with a complement containing PRO only has the *de se* reading. For the temporal domain, a zero tense complement under *glauben* will have a temporal *de se* reading. Usually, mood is zero in complements under attitudes, and the bound zero world variable will correspond to the doxastic alternative worlds. Relative readings (back- or forward-shifted readings and shifted subjunctive II under attitudes) are special readings which are related to *de se* readings. Additionally, there are *de re* interpretation attested in all domains (pronouns, temporal double access and some readings of subjunctive II under attitudes).

The most important observation of this chapter is that there are *derived de se* readings for all domains. If the default relation is expressed, it may override the default relation without interpretative effects. This holds for *de se* subject pronouns in the domain of person, future markers under future-oriented predicates in the temporal domain, and for the modal domain it holds for certain evidential modals under attitudes, and circumstantial modals under influence predicates. Subjunctive I under intensional predicates may be interpreted *derived de se* because all intensional predicates involve quantification over worlds and subjunctive I does so as well. The variable which receives a *derived de se* reading will have to move to a concept-position (which is similar to the concept generator in Percus & Sauerland, 2003a) and be 'recognized' as the default relation. For the individual domain, this means that 'he' *may* be identified with the holder's self. Since there are no logophoric pronouns in German and English and thus the difference between identity and non-identity cannot be expressed, third person pronouns are ambiguous between the *derived de se* and a *de re* reading. For the temporal domain, predicates like *expect* provide posterior relations of times. When a complement in German contains a future marker, it receives a *derived de se* interpretation if the future marker is moved to

the concept position and is recognized as the default temporal relation. The same holds for relations between sets of worlds.

In the following table, I sum up some *derived de se* readings attested in the domain of tense and mood:

Predicate	default relation	expressed by
future-oriented predicates	$t'<t''$	*werden*
attitudes	$\forall w' \in \mathrm{W}_{epistemic,x,w} \rightarrow p(w')$	subjunctive I
influence predicates (dispos.)	$\forall w' \in \mathrm{W}_{disposition,y,w} \rightarrow p(w')$	$müssen_{dispos.}$
influence predicates (deontic)	$\forall w' \in \mathrm{W}_{denotic,y,w} \rightarrow p(w')$	$sollen_{deontic}$

What does this tell us about the complement types? For infinitival complements, the predictions are easy to give. As infinitival complements contain a PRO subject, zero tense and zero mood, infinitival complements always take over the default relation as provided by the predicate for this domain.

We have seen that finite clauses have two readings. Whenever mood and tense are interpreted as featureless mood/tense (and the complement denotes a property of worlds and times) the finite and the infinitival complement are equivalent. Generally, *de re* readings can only appear with finite complements. This holds for *derived de se* readings as well. The strongest evidence for this comes from *sollen* under *befehlen*:

(282) Peter befiehlt Anna, dass sie still sein soll.

(283) *Peter befiehlt Anna, still sein zu sollen.

I have traced back the ungrammaticality of *sollen* in infinitival complements under influence predicates to the fact that deontic modality must not be iterated. Iteration, I claim, can be avoided if the modal is interpreted *derived de se*, an option available only in the finite complement.

This analysis presupposes that intensional predicates in general are compatible with both finite and infinitival complements. This is certainly true for the prototypical intensional predicates which this thesis focuses on. For the sake of concreteness, I give some examples in (284) though (287) which show that the finite and infinitival complements are interchangeable.[21]

(284) a. Peter glaubt/erwartet/vermutet/bezweifelt, der schnellste Fahrer zu sein.

[21] Trivially, the control relations have to fit the infinitival clause.

b. Peter glaubt/erwartet/vermutet/bezweifelt, dass er der schnellste Fahrer ist.

(285) a. Peter nimmt an/schätzt/geht davon aus/ist überzeugt, das Rennen zu gewinnen.

b. Peter nimmt an/schätzt/geht davon aus/ist überzeugt, dass er das Rennen gewinnt.

(286) a. Peter meint/spekuliert/sagt vorher/ist sicher, den besten Wagen zu haben.

b. Peter meint/spekuliert/sagt vorher/ist sicher, dass er den besten Wagen hat.

(287) a. Peter träumt/stellt sich vor/hofft/malt sich aus/bildet sich ein/wünscht sich, von allen gemocht zu werden.

b. Peter träumt/stellt sich vor/hofft/malt sich aus/bildet sich ein/wünscht sich, dass er von allen gemocht wird.

As is shown in examples (288) and (289), even predicates like *denken* — which seem to disprefer infinitival complements at first sight — can be found with an infinitival complement:

(288) Wer denkt, seinen 486-er als Sprachspielzeug einsetzen zu können, kann seine Hoffnungen gleich begraben. (COSMAS A97/NOV.42767)

(289) Damals habe ich ihm geglaubt, dachte, als Mutter völlig versagt zu haben. (COSMAS A98/JAN.03406)

Within certain restrictions which I cannot go into here, *verba dicendi* are also compatible with infinitival complements. There seem to be semantic restrictions on the occurrences of the complement types, which shows that categorial selection takes second place to semantic selection. I suspect that the arguments of *verba dicendi* have a denotation which is ambiguous between speech acts and propositions. If we assume that only finite clauses and not infinitival complements may denote speech acts, the propositional reading is much better when the speech act denotation is blocked. This can be done by modals like *können* embedding the *verbum dicendi*. There is no actual speech act, thus the complement denotes a proposition and the infinitival complement is well-formed.

(290) Wer kann von sich sagen, noch nie Zweifel gehabt zu haben, welche Partei er ankreuzen solle? (COSMAS N98/MAR.08624)

(291) Doch nur der Kanadier Donovan Bailey kann von sich sagen, so früh im Jahr noch nie so gut in Form gewesen zu sein. (COSMAS E97/MAI.13046)

There is one true exception which is not covered by the assumptions of this thesis. The propositional predicate *Finden* is only marginally compatible with infinitival complements.

(292) ?Er mag zwar finden, hier im Recht zu sein, das ist er aber nicht.

Apart from this exception, propositional predicates allow both for *dass*-clauses and for infinitival complements without semantic differences.

As for influence predicates, again, both finite and infinitival complements are grammatical. Again, for concreteness, examples are listed in (293) though (296)

(293) a. Ihre Mutter erlaubt/verbietet/untersagt/gestattet Maria, ihren Freund mit nach Hause zu bringen.

b. Ihre Mutter erlaubt/verbietet/untersagt/gestattet Maria, dass sie ihren Freund mit nach Hause bringt.

(294) a. Ihre Mutter befiehlt Maria/schreibt Maria vor/ordnet Maria an, mit ihrem Freund Schluss zu machen.

b. Ihre Mutter befiehlt Maria/schreibt Maria vor/ordnet Maria an, dass sie mit ihrem Freund Schluss macht.

(295) a. Ihre Mutter ermöglicht Maria/macht (es) Maria möglich, ihren Freund wiederzusehen.

b. Ihre Mutter ermöglicht Maria/macht (es) Maria möglich, dass sie ihren Freund wiedersieht.

(296) a. Ihre Mutter hindert Maria daran/hält Maria davon ab, ihren Freund wiederzusehen.

b. Ihre Mutter hindert Maria daran/hält Maria davon ab, dass sie ihren Freund wiedersieht.

We have seen that in almost every case, intensional predicates, i.e. attitudes and influence predicates, are compatible with both infinitival and *dass*-complement. However, there is an empirical issue which has to be taken

seriously: Why are finite clauses more frequent under attitudes while infinitival complements are more frequent under influence predicates although both select for the same semantic type? I propose that there are three reasons for this.

First, it depends on the alternative relations which a predicate allows. In contrast to attitudes, the licit individual relations are quite restricted with influence predicates. While a finite clause may express non-identity formally, this is illicit with most influence predicates.

(297) # Peter$_i$ zwingt Anna dazu, dass er$_i$ im Haus bleibt.

With influence predicates, the licit relations usually contain the default relation. Consequently, a finite clause — which has a greater variability — will not express more than the default relation(s). This means that for influence predicates, the finite clause has no advantage over the infinitival clause.

This is different for attiudes. As for *believe*, every possible individual may be the subject of our beliefs, therefore the whole range of beliefs can only be expressed by finite clauses because the predicates permits more relations than just the default relation.

Second, infinitival complements are preferred whenever the relationship between the matrix and the embedded event is close. It is certainly closer with influence predicates. It is a question of syntactic integration which might mirror the semantic relationship (cf. the more functional features of an object are left 'infinite', the more likely it will be realized as an infinitival complement, see Noonan (1985); on integration as reflection of semantic connection see Borkin (1974), König & van der Auwera (1988), Jacobs (1993), Raible (1992)). Rohdenburg (1995) outs forward the Principle of Clause Integration:

> The degree to which the dependent clause is integrated into its superordinate clause correlates (inversely) with the degree of its semantic independence.

Obviously, two events which are causally related are closer when they are in an epistemic relationship.

Zifonun et al. (1997) (p. 1470 (2)) state that finite complement clauses are preferred whenever a state-of-affairs is semantically independent, like propositions and facts. Whenever matrix and embedded proposition are linked more closely, the infinitival complement is preferred.

Third, there is a cognitive argument. Variable binding might be more costly cognitively. Intuitively, although we 'know' that an influence predicate binds the embedded world variable and quantifies over worlds deontically or circumstantially, it is much more transparent to express this relationship with a modal, via *derived de se* — an option we have only with finite complements. The finite clause is simply more explicit. Spoken language, under the pressure of time, prefers redundancy, redundancy that we have seen in the case of modal verbs under influence predicates or with dummy finite implicative complements. In the words of Chafe (1982): '[Integration is] the packing of more information into an idea unit than the rapid pace of spoken language would normally allow' (p. 39), see also Thompson (1984). This has been supported by the empirical findings of Rohdenburg (1995). He found out that the deeper a sentential complement is embedded, the more likely it will be a finite clause. The same goes for second conjuncts of sentential conjunction. The more material intervenes between the matrix and the embedded clause, the more likely a finite clause will be used. In short, finite clauses on the one hand are more ambiguous but can be made more explicit. They may express a wider ranger of states of affairs and they are easier to produce.

For *behaupten*, the frequency of V2 complements (which I will address in section 4.4), infinitival and finite complements were investigated in a small corpus study[22]. For the 212 hits for *behaupten* with a sentential argument, the frequency is given in this table.

spoken language			written language		
dass	infinitive	V2	dass	infinitive	V2
23,6 %	12,5 %	62,9%	30,1%	1,6%	68,3%

If we compare infinitival and finite complements only, we see that infinitival complements are more frequent in written language (see also Höhne-Leska (1975) who as a result has a 2:1 relation of infinitival complements in written vs. spoken discourse). This is unexpected when we think of statements like the one of Beneš (1979), who calls infinitival complements 'vague'. Why should written language be more imprecise? I have shown that for finite complements, we get a lot of interpretations. Tense, mood and person

[22]I used a corpus for written language, the subcorpus L98 Berliner Morgenpost 1998; for spoken language, I used the corpus of the *dwds*, from 1980 to 2001. See `www.dwds.de`

may be interpreted *de dicto, de re* or *derived de se*. My impression is that vice versa it is the infinitive which is more precise because the default relations are part of the lexical semantics. There are view cases (like control shift and arbitrary control) where the reference (of person, for instance) is not unambiguous. Hence, it is the finite clause which is vague.

In sum, infinitival complements are more precise, but more costly cognitively, and will generally be preferred in written language.

Chapter 3

Extensional predicates

3.1 Overview

The basic idea I spelled out in chapter 2 is that intensional predicates are characterized by their ability to bind mood and tense, as their lexical semantics provides a binder index for mood and tense (and person). In this chapter, we will see that in contrast to intensional predicates, extensional predicates do not bind the mood and tense variable of their complement. Time and mood have to be interpreted as free variables. Indexical interpretation of mood and tense in turn permits a situative interpretation (or eventive in the terms of Portner, 1992).

First, I will show that mood and tense are not bound under an extensional matrix predicate, but that mood in its complements has an indexical interpretation. Second, we will have to find a way to show that a situation of the actual world can be believed *de re* and become the (subjective) attitude of a holder. Thirdly, I will address ontological issues and show how propositions, situations and facts are related. Fourthly, I will be concerned with the pragmatic effect of indexical mood in subordinate clauses: factive predicates give rise to presuppositions. Presuppositions can be accounted for in semantic or in pragmatic terms. For presuppositions under factive predicates, I will argue that it is the absence of assertion which is responsible for the presuppositional properties.

The crucial thing about facts is that they are true in their utterance situation. As is well-known since Kiparsky & Kiparsky (1971), factive predicates presuppose the truth of their complement. The presupposition obtains when

the matrix clause is negated:

(298) Peter bemerkt, dass Anna recht hat. (presupposes: Anna is right)

(299) Peter bemerkt nicht, dass Anna recht hat.
(presupposes: Anna is right)

Presuppositions also remain unaffected under interrogatives and imperatives:

(300) Bedauert Peter, dass Anna recht hat? (presupposes: Anna is right)

(301) Bedauer doch nicht, dass Anna recht hat!
(presupposes: Anna is right)

I will address two classes of factive predicates, emotive and cognitive factives. Kiparsky & Kiparsky (1971) make a distinction between *emotive* and *non-emotive* factives (which I will refer to as 'cognitives'). Emotive predicates express a subjective, emotional or evaluative reaction by the agent[1] towards the presupposed object. Emotive factives presuppose the existence of a fact and assert an emotional attitude towards this fact. Cognitive factives on the other hand presuppose the existence of a fact and specify how the holder is or became acquainted with the fact cognitively.

(302) Peter bedauert, dass Anna krank ist. (emotive)
others: *bereuen, sich ärgern über, sich beklagen über, sich entschuldigen für, sich freuen über, jm. gönnen, hassen, lieben, verübeln, sich wundern*

(303) Peter bemerkt, dass Anna krank ist. (cognitive)
others: *beobachten, entdecken, erfahren, erkennen, fühlen, herausfinden, ignorieren, jm. klarmachen, merken, sehen, wahrnehmen, vergessen, jn. hinweisen auf*

Under some conditions, certain cognitive factives, unlike emotive factives, seem to 'lose' their presuppositional character. For this reason they have been labelled semi-factive predicates in Karttunen (1971c).

(304) Bemerkst du, dass er sich verändert hat?
(± presupposed, semifactive)

[1] Kiparsky & Kiparsky (1971) state that this is the speaker's reaction, which obviously is not true. They generalize their observation from first person statements and emotive subject clauses which express a judgement made by the speaker but this is a structural property of subject clause factives.

(305) Bedauerst du, dass er sich verändert hat?
(presupposed, 'full' factive)

I will be concerned with the semi-factives in section 3.4.1.

3.2 Tense and mood

To my knowledge, the behavior of factives with respect to mood and tense has never been paid much attention to (for an exception see Ormazabal, 2005, who independently makes similar observations). Usually, factives count as the exception to a rule with respect to sequence of tense phenomena, but it is never considered whether this tells us something about the nature of factive predicates. For my argumentation, their behavior with respect to mood and tense is central.

We will investigate in detail how tense and mood behave under factive predicates. We have seen in the preceding chapter that mood and tense are bound under attitudes. Bound mood and tense may have a different morphosyntactic make-up (finite and non-finite in German, non-finite and if finite then with feature agreement in English), but they have to be interpreted as zero mood and zero tense. My argument here is that under factives, mood and tense are not bound. The argumentation is tricky for two reasons. First, there are few cases where we can distinguish zero and indexical mood and tense from their zero counterparts. Second, we will see that nearly every factive predicate underlyingly has an attitude-like semantics[2] — whenever someone notices something, he will have a mental representation of this entity which probably corresponds to a proposition. This, however, does not necessarily imply that the propositional layer is expressed linguistically. Still, this is a complicating factor for all tests: ehenever we have bound readings, we may overlook the attitude-shift of the predicate. Nonetheless, there will be convincing arguments in favor of my claim that there is a difference between tense/mood under attitudes and factives.

3.2.1 Tense under factives

We have seen in section 2.2.2 that zero tense has to be bound by the matrix under attitudes. The effect is that the embedded present tense is not inter-

[2]Bonevac (1984) calls predicates like *know, see, remember, find* 'intensional factives' because they involve extensionality but share properties with attitudes.

preted indexically but as a zero tense and will by binding correspond to the holder's subjective now.

(306) Peter glaubte, dass Karl müde ist.

(307) PAST [1 [t_1 Peter glaubt dass 1 [$\emptyset_1$ [Karl ist müde]]]]

It is crucial to recall the difference between German and English here. In English, zero tense has to inherit the morphological features from the matrix. The English counterpart of (306) is a past-under-past sentence:

(308) Peter believed that Karl was tired.

(309) PAST [1 [t_1 Peter believe that 1 [$\emptyset_1$ [Karl is tired]]]]

Why are we so sure that mood in the English example is bound? It may well be indexical tense. However, we get sloppy readings in quantified contexts:

(310) Every morning, Peter believed that Karl was tired.

Example (310) has a sloppy reading. Every morning, Peter believed that Karl was tired at that time. This provides evidence that the past tense in (308) can be a bound tense. In German, morphological present plays this part:

(311) Jeden Morgen glaubte Peter, dass Karl müde ist.

What about factive contexts? In (312), the embedded event is simultaneous with the matrix event.

(312) Paula bedauerte, dass Karl krank war.

The question is whether the embedded tense is bound zero tense or not, i. e. whether it denotes a subjective tense or not. The corresponding LFs are given in (313) and (314).

(313) PAST [1 [t_1 Paula bedauert dass 1 [$\emptyset_1$ [Karl ist krank]]]]

(314) PAST_1 [1 [t_1 Paula bedauert dass [PAST_2 [2 [t_2 [Karl ist krank]]]]]]

If factives have a temporal interpretation like attitudes, (313) is the correct interpretation. If the past feature on the embedded verb is not bound but indexical, the correct LF would be (314) where both the matrix and the embedded tense are interpreted indexically. How can we decide which LF is correct?

This is apparent in present-under-past-sentences:

(315) Paula verheimlichte gestern, dass Karl müde ist.

This, in a nutshell, is the central observation of this chapter: (315) clearly has a double-access reading in German like the double access readings that we saw in English present-under-past sentences. Karl's state of being tired has to overlap with the speech time in (315). It is not a subjective time, hence, it is not a temporal PRO.

We have seen that in English, feature agreement is obligatory in bound readings. Whenever we get a feature mismatch, the bound reading is 'broken' and we have to interpret both tenses indexically. This is the *de re* interpretation as developed by Abusch (1997). If in German, present-under-past with factive matrix predicates only has a double access reading, and the bound reading — which should be accessible for present in all contexts — is excluded, it is certain that tense is not bound under this predicate. If it does not bind tense in present-under-past sentences, this probably means it never binds tense. This follows from analogy, but there is additional evidence from quantificational contexts. Example (316) does not have the sloppy reading which it would have if tense was bound. The much more salient reading is that Peter has an affair for the whole time span. Every Sunday, he concealed this fact. This means that the complement may be interpreted outside the scope of the temporal quantifier which requires raising. This is not possible with a temporal PRO.[3]

(316) Peter verheimlichte jeden Sonntag, dass er ein Verhältnis hat.

Furthermore, there is evidence that there is no relative bound future in factive complements.

(317) Morgen wird er glauben, dass alle Studenten schon abgaben. (two readings) [cf. Katz (2001), (30)]

(318) Morgen wird er bedauern, dass alle Studenten schon abgaben. (one reading)

[3]There are generic readings which seem to stand in conflict with this observation (Marga Reis, p.c.):

(i) Peter verheimlicht jeden Sonntag, dass er jeweils um 8h noch müde ist.

I assume that the complement is interpreted as generic here or that tense in the complement is anaphoric to the time interval quantified over in the temporal adverbial (similar to anaphoric mood in conditionals, see below.) It is thus not a counterargument to my claim.

(319) Morgen wird er ahnen, dass alle Studenten schon abgaben. (one reading)

Example (317) can be interpreted in two ways. In the first reading, the embedded past is situated before the thinking — a bound relative past. The second reading anchors the embedded event in the past. Crucially, in factive complements, there is only one reading. We cannot interpret (318) and (319) as a relative bound past future — it has to be interpreted with respect to the utterance time.

Additionally, there is crosslinguistic evidence. In Romanian, similarly to German, present tense may have *de se* readings under matrix past in intensional contexts:

(320) Romanian

Va crede că cineva îi citeşte scrisorile.
aux.PRES.3sg think that someone CL.3sg. read.PRES letters

'He/she thought that someone read the letters.'

(Lungu, 2009)

Under factives, in contrast, only past-under-past is allowed (Oana Lungu, p.c.). Present under past has a double access reading. With the *verbum dicendi spune* 'tell', both tenses are attested. With past-under-past, the holder is considered more reliable than in present-under-past sentences.

(321) Romanian

Acum zece ani, Mircea mi-a spus că Mirela aşteaptă
Ten years ago, Mircea me has told that Mirela
un copil.
expect.PRES a baby

'Ten years ago, Mircea told me that Mirela expected a baby.'

(Lungu, 2009)

In Hungarian, again, the same pattern is attested (examples due to Aniko Csirmaz, p.c.). Present tense under attitudes may receive a simultaneous reading, while with factives, present-under-past is clearly marked. *Már* 'already' seems to make the factive examples more acceptable, probably because it supports a double access reading.

(322) Hungarian

Feri azt hitte, hogy (már) tíz óra van.
Feri.nom that.acc believe that already ten o'clock is

'Feri believed that it was already 10 o'clock'

(323) Feri rájött, hogy ??(már) tíz óra van.
Feri.nom realized that already ten o'clock is.
'Feri realized that it's already 10 o'clock'

These data provide evidence that tense under attitudes is interpreted differently from tense under factives. I have argued that in German, tense under factives is interpreted indexically. The following section shows that this holds for mood in German as well.

3.2.2 Mood under factives

The argument here is parallel with the one for bound and indexical tenses. Corresponding to present-under-past sentences, consider indicative-under-subjunctive:

(324) Peter würde bedauern, dass Anna verärgert ist (wenn er es bemerken würde).

The indicative should — just like the present tense in the temporal domain — be a realization of modal PRO. But in these examples, the embedded proposition is evaluated with respect to the actual world. Thus, we get a kind of (modal) double access reading again: there is a fact in the actual world which Peter would be acquainted with in other possible worlds.

Admittedly, there is a non-factive reading, but this reading is clearly marked:

(325) ?Peter würde bedauern, dass Anna verärgert ist (wenn sie es denn wäre).

For better judgements, the *dass*-clause should be changed to a *wenn*-clause. The *dass*-clause does not seem to have this reading.

If mood was bound under factives, we ought to get optional feature agreement. With attitudes, feature agreement in the modal domain is optional in German. But (327) is odd.

(326) Peter würde glauben, dass Maria schwanger wäre/ist.

(327) ?Peter würde bedauern, dass Maria schwanger wäre.

Intuitively, for (327), it seems that the conditions triggering the irrealis mood should be different in the matrix and the embedded sentence.

(328) Wenn Peter mitfühlender wäre, würde er bedauern, dass Maria sauer wäre, wenn Peter sie verlassen würde.

We may give scenarios for (327) as illustrated in (328), for example that she would be annoyed if he left her and that he would regret a hypothetical fact if he was more sensitive. I doubt that (327) additionally has an anaphoric reading.

Speas (2006) and Basse (2008) also notice that, unlike attitudes, factives do not bind the world variable of their complement. What they have in mind, though, is the 'source' of quantification; this analysis might be comparable if we capture the 'modal source' of the doxastic quantification by a modal perspective. This can be shown by examples like (330).

(329) Peter believes that Iraq must have nuclear weapons.

(330) Peter regrets that Iraq must have nuclear weapons.

While in (329), the modal base for the interpretation of *must* has a *derived de se* reading, this reading is unavailable in (330). We cannot interpret *must* as epistemic in (330), hence it is not redundant. The embedded modal cannot be bound by the matrix, i. e. identified with the default relation (of doxastic quantification). Thus, we have to interpret *must* as in root clauses. This holds for the German counterpart as well:

(331) Peter bedauert, dass Irak Atomwaffen haben muss.

There is no doubt that mood and tense are not bound by the control predicate. There is no subjective now, there is no epistemic quantification. The time and world variables are not bound by a lexical binder provided by the embedding predicate. Thus, mood and tense under factives are interpreted indexically — or more generally, they are interpreted like in extensional contexts.

In the following section, we will approach factive complements from a different ontological and formal perspective. We will see afterwards that there is a connection to the behavior of factive complements with respect to tense and mood.

3.3 Facts

From an ontological perspective — what is a fact? And how can we connect the ontological discussion with the insight that tense and mood are indexical in factive complements?

I assume that the semantics of emotive factive predicates needs three 'ingredients'. First, there is a fact. Second, the experiencer must be acquainted with this fact. Third, he must have a mental representation of this fact, he must believe that this fact holds. This last ingredient is the propositional part.

(332) Peter bedauert, dass Anna schwanger ist.

The factive 'ingredient', as I put it, comes from the fact that tense and mood in the complement are not bound by *bedauern* (as under attitudes) but are anchored to the utterance situation. Let us assume that it is the *speaker* who believes that the situation expressed in the complement is a fact (in his doxastic worlds). What about Peter? If Anna's pregnancy did not hold in his doxastic worlds or if he had no knowledge about Anna's pregnancy, it would make no sense to assume that he regrets it. This insight led Kratzer (2002) to her statement about the meaning of *know*:

> S knows a proposition p only if
>
> – There is a fact f that exemplifies p. [= truth]
>
> – S believes p *de re* of f. [= belief]
>
> – S can rule out relevant possible alternatives of f that do not exemplify p. [= reliability]
>
> [= Kratzer (2002)]

(The third condition excludes scenarios in which the holder is deceived in spite of his aquaintance relation.) Under her approach, there are two functions of the *that*-clause. The first one is to 'pick out the *res*' the belief is a belief about. Picking out the *res* means to refer to a particular situation of the actual world — I assume that this is possible due to indexical mood and tense.

The second one is to describe the proposition which is exemplified by the fact f. This is the propositional part. Correspondingly, *bedauern* is analogous with *know*: S regrets a proposition p only if:

- There is a fact f that exemplifies p. [= truth]
- S believes p *de re* of f. [= belief]
- S can rule out relevant possible alternatives of f that do not exemplify p. [= reliability]
- S regrets the fact f that exemplifies p. [attitude]

While a cognitivepredicate has two main 'ingredients', presupposition/truth *and* belief, an emotive additionally involves an emotional attitude towards the believed proposition. More obviously than cognitives, emotives involve a propositional 'layer' of representation since regretting somethings means to disprefer p-worlds from non-p-worlds (analogously with predicates like *wish* in Heim, 1992).

What is a fact, ontologically? And what does it mean to have a *de re* belief of a fact?

3.3.1 What is a fact?

In the analysis of natural language it is often assumed that there is reference to abstract ontological objects. The sets of assumed objects differ though. Most approaches assume at least events, propositions and facts as universals (Peterson, 1997, for example). Other ontological primitives are possibilities (Asher, 1993), reasons (Hegarty, 2003) and different kinds of states. From this puzzling array of ontological objects, I will briefly discuss facts here. My aim is to show that facts are an ontological object which cannot be reduced to other ontological objects but which are distinct and at the same time related to both situations or events[4] and propositions.

Certain denotations can only function as a subset of the assumed ontological basic set. This has been shown by Vendler (1967) who examined English gerunds and their restrictions in complementation. Ontological objects may be denoted by different expressions, but not all expressions may have all abstract objects as denotations.

There are well-known linguistic facts that show, for instance, that *that*-clauses do not univocally denote propositions. Some *that*-clauses can be

[4]I assume that events (in contrast with situations) are not instantiated in worlds (cf. Carlson, 2003), who relates event-semantics and the propositional level of semantics), they are situation types, so to speak. Situations are worldly, they are parts of worlds/individuals (see below).

paraphrased by *the proposition that p*, some by *the fact that*. Predicates like *fear* and *imagine* can only be paraphrased by *the possibility*.[5]

(333) a) *x fears the proposition that p.

b) x fears the possibility that p.

c) x fears that p.

Vendler (1967) and Bach (1997) point out that this still does not reflect the whole picture. Vendler (1967) distinguishes events from facts among the denotation of gerunds. Perfect nominals like (334) denote events while imperfect nominals like (335) denote facts:

(334) the singing of the song

(335) John's singing of the song

Vendler (1967) establishes that there are linguistic environments which allow only one of these types but disallow the others. Linguistic environments which allow both are wide 'containers'. So-called narrow 'containers' allow only either events or facts:

(336) a. The singing of the song was slow/took place at noon.

b. *John's singing of the song was slow/took place at noon.

(337) a. The singing of the song surprised us. ??This was the result of clever planning.

b. John's singing of the song surprised us. This was the result of clever planning.

Once we assume that there is abstract reference to different ontological objects, what is the difference between these objects? Are they related?

[5]Moffett (2003) remarks that even this is not enough because there is no appropriate paraphrase for the *that*-clause embedded under *desire*:

(i) *x desires the proposition that p.

(ii) ?x desires the outcome that p.

(iii) x desires that p.

There are no expressions for all combinations of modal bases and modal force — This is why I am sceptical about paraphrases as tests. 'Possibility' is well-formed under desire because it involves weak (doxastic) modal force. Hence, it would be better to describe the default and the licit relations for all predicates — whether there is a corresponding nominal or not.

First, it is important to see that facts differ from (true) propositions. The traditional view of facts as true propositions and knowledge as justified true belief has been disproved by Gettier (1963). This can be shown by an example by Russell (which I adopt from Kratzer, 2002, (1), (2)) in which someone believes that the late Prime Minister's name began with a B. This is true for Mr. Bannerman who is Prime Minister in our scenario. At this step, knowledge could be justified true belief. But now imagine that the man mistook Mr. Balfour for the late Prime Minister. The proposition he believes (that the Prime Minister's name began with a B) is true but under the circumstances of his mistake one would never say that he *knew* this. It seems like there is some 'connection' missing, acquaintance with the thing believed or known.

So are propositions and facts totally distinct? The problem is that facts, possibilities and propositions must be related to each other because it is possible to quantifiy over objects of different ontological types (example taken from Moffett, 2003). In (338), we quantify over both facts and propositions.

(338) Everything x knows, x believes.
$\forall$ p (K(x,p)) $\rightarrow$ (B(x,p))

Moffett (2003) suggests that facts are extensions of propositions. In order to make sure which situations (or as he puts it, state-of-affairs) are related to which proposition, we now have to know which states-of-affairs are in the relevant extension. This work can be done by a correspondence theory of truth so that 'the conditions under which a proposition is true are precisely the conditions under which the corresponding state-of-affairs obtains':[6]

[6]Moffett (2003) needs one more ingredient, namely he needs two kinds of predication. The first one is singular predication. It is predication of a certain property of an individual or individuals. His example for this kind of predication is 'Simba is a lion'. In the case of generic predication things are different. In 'The lion has a mane', *the lion* is a kind-referring term. But crucially, the sentence does not mean that the kind *lion* has a mane but that all of its members do have a mane. This kind of predication is what Moffett (2003) calls generic predication. He now says that predicates like *know* involve generic predication and predicates like *believe* involve singular predication. This means that in the case of *know*, it is predication of single extensions, i. e. states-of-affairs. In the case of *believe*, we get single predication of propositions, the intensions of states-of-affairs. The problem of the doxastic shift in (338) does not occur. His formalization for this example is

(i) ($\forall$p)(<pred$_g$<being known by x, p> $\rightarrow$ pred$_s$<being believed by x, p>>)

As desired, what is known is the fact corresponding to the proposition *that p*, and what

(339) $(\forall p)(p$ is true iff $(\exists s)$(sRp & s obtains))

Kratzer (2002) shows that on the one hand, facts are particulars (what she calls 'worldly facts'), on the other they are related to specific propositions. The former, 'wordly facts', are defined in notions of Situation Theory. S is the set of all possible situations and contains also possible individuals and states as subsets of S. Every possible situation is part of only one world. The maximal set of situations is the possible world. This approach allows us to relate situations and propositions. Propositions are sets of possible situations, namely all situations that are part of this world. Whenever a situation s is part of a proposition p then p is true in s. If we take propositions to be sets of possible situations (and not simply sets of possible worlds) they are themselves situations, namely maximal situations. A fact is a situation of the actual world. Propositions are related to propositional facts, though. 'Facts exemplify propositions as things exemplify properties.' (Kratzer, 2002, p.2). Informally speaking, a fact exemplifies a proposition p if the situation s is a 'pure' situation of the relevant type. The formal description of this exemplifying relation is given in (340=6). Any sub-situation of s in which p is not true must be extendable to a minimal situation in which p is true.

(340) If s is a possible situation and p a proposition, then s is a fact exemplifying p iff for all s' such that $s' \leq s$ and p is not true in s', there is an s'' such that $s' \leq s'' \leq s$, and s'' is a minimal situation in which p is true. (A minimal situation in which p is true is a situation that has no proper parts in which p is true.)

This can be used for the semantics of complementation. Portner (1992) develops a semantics of gerunds, infinitives and indicative and subjunctive clauses in English using a Kratzerian situations semantics. Under Portner's approach, it is possible to describe all complements uniformally as sets of possible situations. For instance, on the Vendlerian view, verbal gerunds can denote facts or propositions, as stated by Vendler (1967) and Zucchi (1989), but they also have an event reading (Portner, 1992, p. 89).

(341) I seldom minded Mary using the telephone.

In (341), we get quantification over situations. This reading is paraphrased by Portner (1992) as 'few events of Mary using the telephone are such that I minded them' (p. 90).

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is believed is the proposition itself.

Portner's idea is that verbal gerunds always denote propositions but that it is also possible to 'pick out' individual situations or events for eventive predicates. The difference between matrix predicates can be captured by looking at which set of minimal situations is picked out from the superset of minimal situations. Portner (1992) gives the following examples in (342) through (344):

(342) Mary denied climbing Savoy Mountain.

(343) Mary regretted climbing Savoy Mountain.

(344) Mary always enjoyed climbing Savoy Mountain.

The denotation of the gerund can be given uniformly in (345):

(345) ing(climb(Mary)(Savoy Mountain)) = {s: s is a minimal situation of Mary climbing Savoy Mountain}

[= Portner (1992), (18)]

While in (342), this proposition is directly the argument of the propositional attitude predicate *deny*, in (343), the matrix predicate expresses a relation towards a single situation from the set (which is derived via quantifier raising of the gerund). In (344), via quantification we get an *enjoy*-relation towards every single minimal situation.

However, the case of finite (and infinitival) clauses is different. Indexical mood and tense determine an extensional reading for all complements. It will denote a definite situation, something which is 'fixed' in time and world. For this reason, a fact is true forever because its being (correctly) anchored at a time in a world does not change throughout time. To say it with Ramsey (1927), the event of Caesar's death took place in Rome in 44 B.C., but the fact that Caesar died (in 44 B.C., in the history of this actual world) is a fact now and 100 years ago. This remains true forever because a fact is always expressed with respect to the utterance situation.

The assumption that the speaker has a particular situation in mind and asserts that someone else believes this situation to be true, i. e. his doxastic alternatives contain a counterpart situation of this situation, entails that there are counterpart-relations between situations in the sense of Lewis (1979). A situation is accessible to the holder and the speaker can only felicitously assert a sentence containing a factive predicate when he presupposes that the holder's belief refers to the same situation he has in mind.

But this is not a costly assumption, since *de re* analyzes need counterpart relations between believed objects and facts (definite situations referred to by the speaker) as well.

Hence, in sentences like (346), the complement clause is true in the speaker's subjective worlds.

(346) Speaker: Peter bemerkt, dass Anna recht hat.

In a strict sense, the speaker does not have access to the Peter's belief worlds. But when he utters an assertion like (346), he pretends to do so, as in all belief reports. I assume that the latter is usually not expressed linguistically. We probably infer that the holder believes the proposition which exemplifies the fact.

Via indexical mood and tense, we refer to a situation, because it is situations which are the extensions of propositions. And via belief ascription we assert that this presupposed situation has counterparts in the holder's epistemic worlds.

3.3.2 The semantics of factive predicates

I will now propose a formal semantic representation of factives. I have already shown that tense and mood in factive complements are interpreted indexically, i. e. independently from the matrix tense. Factive predicates do not bind the tense and world variable of their complement but select for eventive complements. I will assume that factive complements are QR-ed to a position higher than the matrix clause.

Before turning to factives, I will briefly consider perception predicates. Von Stechow 2009 reports (based on Khomitsevich, 2007) that perception verbs in Russian show a different tense pattern than attitudes. While under attitudes (likewise in German), simultaneity is ususally expressed by present under past, and in sentences with perception predicates, we get past under past or present under past:

(347) Dina videla chto/kak voda lilas'/l'jösja iz vedra.
Dina saw that/how water poured/pours from basket.
'Dina saw that/how water was pouring from the basket'
[example taken from von Stechow (2009), (61)]

Perception predicates are, in the standard analysis of Higginbotham (1983), eventive. They express relations between an individual and an event. Cru-

cially, von Stechow (2009) notices, the event may be localized in time in a *how*-complement. Von Stechow (2009) analyzes (347) in the following way:

(348) $\lambda w(\exists e)(\exists t{<}s*)[\mathrm{t}\subseteq \tau(e)$ & water pouring$_w$ (e) & $(\exists t'{<}s*)(\exists e')(t'\subseteq \tau(e'))$ see$_w$(Dina, $e'e)]$

Both the matrix and the embedded tense are interpreted indexically.

Under attitudes in Russian, we get present tense just like in German. The fact that past tense is possible under perception verbs in *kak(how)*-complements in Russian shows that the embedded tense is anaphoric to the matrix tense. Von Stechow 2009 notices that it is problematic for their account that past tense under perception verbs is interchangeable with present tense.

In German, the facts are slightly different. In principle, both present and past tense are possible under perception verbs and matrix past. Past tense is much more frequent, see (349). According to my intuitions, a present tense as in (350) usually has a double access reading. However, there are examples of present under past which seem to have a more subjective flavor, like (351).

(349) Als er im Fernsehen sah, wie sein Trainingskollege Philipp Huber an der WM in Athen mit 8100 Punkten eine persönliche Bestleistung erzielte,... (COSMAS A97/OKT.28715)

(350) Als er aber das Hauptquartier in Amerika besuchte und sah, wie gross und wie professionell organisiert der Betrieb ist, hat er seine Meinung geändert. (COSMAS E99/OKT.27568)

(351) Ich sah gestern noch, wie er den Müll runterträgt, und nun soll er tot sein?

In general, tense under perception predicates in German seems to be indexical and not anaphoric.

What do perception predicates and factives have in common? I assume that it holds for both that the embedded tense is not a temporal PRO bound by a lexical binder (as holds for attitudes).

Furthermore, since there are many perception predicates which are factive with a *dass*-complement (*hören/sehen/spüren, dass*), it is reasonable to transfer this analysis to factive predicates like *bemerken* in (352):

(352) Peter bemerkte, dass Anna krank war.

I assume that in contrast to perception predicates, tense is not anaphoric but indexical under cognitives. If tense was anaphoric, the matrix and the embedded event in (352) should be simultaneous. As we have seen, it is possible to have a backshifted reading, i. e. two indexical past tenses which are not coindexed. Hence, I assume that both are interpreted independently with respect to the utterance time.

Thus, factive complements, in contrast to propositional complements, carry indexical tense and mood. This allows us to QR the complement and interpret it outside the scope of the matrix predicate. First, we need a slightly modified aspect operator for IPF and PER aspect (A. v. Stechow, p.c.).

(353) IPF = $\lambda \mathrm{E}_{vt}.\lambda t.\lambda e'.\ \mathrm{E}(e)\ \&\ \tau(e') \supset t$

The difference between the standard formalization and (353) is that the event variable is not bound by an existential operator but is lambda-bound. We need this in order to have access to the event argument in the further derivation. It is the default option to bind it existentially.

(354) $\lambda t.\lambda e'\ \tau(e') \supset t$ & krank(Anna,e')

As a next step, we have to interpret indexical past tense.

(355) λe'.$\exists$t [t<s* & τ(e') $\supset$ t & krank(Anna,e')]

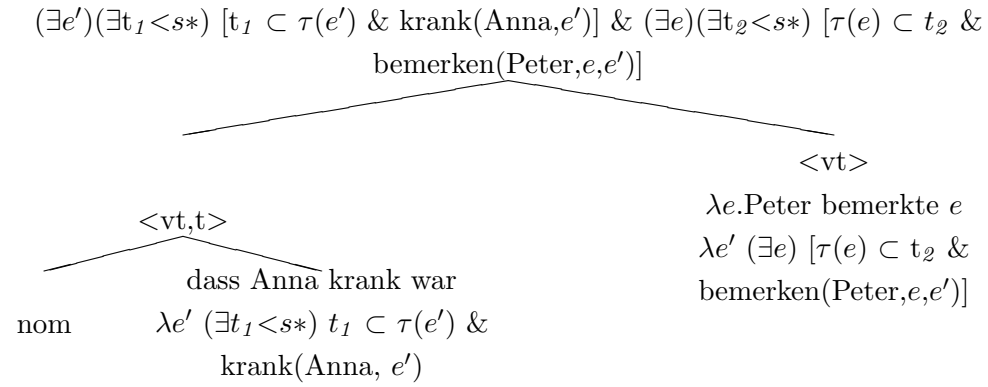
The fomula in (355) denotes the property of being an imperfective event in the past of Anna being sick. Via a nominalization operator (similar to gerunds) we get a generalized quantifier of type <vt,t>. The operator is of type <vt><vt,t>. The event 'becomes' definite at this point.

(356) $(\exists e')(\exists t)$ [t<$s*$ & $\tau(e') \supset t$ & krank(Anna,e')]

Now we can combine the complement with the matrix clause.

(357) Peter bemerkte, dass Anna krank war.

(358)



On the other hand, as mentioned above, there is a propositional layer in factive predicates, at least with emotive predicates, as emotives require that the holder has a mental representation of the fact which he relates to other propositions that are epistemically accessible. Consequently, the complement clause seems to play a double role. On the one hand, it denotes a fact, on the other hand, it has a propositional denotation and describes the holder's 'belief content'. The observations for the temporal and modal domain, however, show that it is the fact-denotation that is primary — otherwise factives would not differ from attitudes in their complements' tense/mood system. We cannot avoid that the complement clause has to be interpreted twice — denoting a fact and a proposition. There is no implementation for this. Thus, I assume that the propositional layer is somehow secondary and I speculate that it may be due to a lexical presupposition that a holder believes what he regrets. This second layer, however, can become the primary layer under shifting (see 5.2).

3.4 Presupposition

I have argued that facts differ from events and from true propositions. They differ from events because they are definite, due to indexical tense and mood. In the large literature on presuppositions, facts are often conceptualized as presuppositions which have to be admitted by the common ground. Under this view, facts should be propositions because a fact only differs from a proposition because it is (assumed to be) part of the common ground. Consequently, there is no ontological difference between facts and true propo-

sitions. As this assumption conflicts with the approach developed here, I address presuppositions in detail here. I will show that presuppositions do not hinge on the common ground and that we can cope with phenomena related to presuppositions in this approach as well.

Factive predicates are triggers for presuppositions. The truth of the complement clause is presupposed in (359):

(359) Peter bemerkt, dass Anna gar nicht lacht.

It has been proposed that the factivity has to do with the fact that factives contain indexical mood, hence factivity is a lexical property of the predicate which may be traced back to the predicate's lexical binding properties. This view will be contrasted with a pragmatic view which analyzes presuppositions as admittance conditions: presuppositions have to be admitted by the common ground, i. e. be part of the common ground. The common ground is the set of propositions assumed to be shared by the participants in a discourse. With every new piece of information, the set of propositions 'narrows' down until — in an idealized conversation — we know which world we are in. If the presupposition is already entailed in the common ground, it will be redundant. In this way, presuppositions can be analyzed as admittance conditions. A sentence like (359) will only be accepted in a conversation if the common ground contains the presupposition that Anna does not laugh. If it does not contain this proposition, it may be *accommodated*, which means that we are ready to accept for the sake of the conversation a certain amount of presupposed information we do not share.

If my indexical mood/tense approach for factive complements is correct, it will have to deal with the main facts known from issues related to presupposition.

For the issue of presupposition projection in complex sentences, I will consider two cases of conditional sentences: first factives in the antecedent in section 3.4.1 and second, cases where the presupposition is part of the consequent:

(360) Wenn Anna aufmerksam ist, bemerkt sie, dass Peter unglücklich ist. (indicative conditional)

(361) Wenn Anna aufmerksamer wäre, würde sie bemerken, dass Peter unglücklich ist. (counterfactual)

These presuppositions will be addressed in section 3.4.1.

3.4.1 Presuppositions in conditionals

Presuppositions in the antecedent

The presuppositions both in (362) and in (363) obtain in conditionals.

(362) Wenn er einsieht, dass Anna recht hat, finde ich ihn nicht ignorant. (indicative conditional)

(363) Wenn er einsehen würde, dass Anna recht hat, würde ich ihn nicht so ignorant finden. (counterfactual)

The presuppositions of the antecedent are 'projected' to the compound sentence. I assume that this is possible because tense and mood under factives are indexical and hence may be QR-ed to a position outside the scope of the conditional.

In a Kratzerian conditional semantics which assumes an implicit modal for the interpretation of the consequent, (362) and (363) can be paraphrased as:

(364) Anna is right, and it follows from all worlds w' maximally similar to w_0 in which he accepts this, that I do not consider him ignorant in w'.

(365) Anna is right, and it follows from all worlds w' (excluding w_0) in which he accepts this, that I do not consider him ignorant in w'.

Be aware that mood in the antecedent has to be anaphoric to mood in the consequent. Mood in the factive complement clause is not anaphoric in the presupposed reading. Thus, it is easy to capture conditionals in an approach which treats mood as a variable which may be free or anaphoric.

There is a group of cognitive factives which Karttunen (1971c) referred to as 'semi-factives'. Semi-factives lose their presupposition when embedded in hypothetical contexts.

(366) If I realize later that I have not told the truth, I will confess it to everyone.

In (366), the presupposition in the antecedent is not presupposed by the whole sentence. Why?

I propose an analysis which optionally treats mood as anaphoric under semifactive predicates. The crucial point is that the truth of the fact depends

on the speaker's reasoning. Only what the speaker considers to be true can be presupposed because indexical mood is anchored to the speaker's actual world. I will assume that there is no absolute 'actual world' but only speaker-related actual worlds: a fact can only be a fact of the actual world if the speaker anchors the proposition in his actual world. (This view will be elaborated in more detail in section 3.4.2.)

With third person subjects, the interpretation is ambiguous between a presupposed and a non-presupposed reading. With first person subjects, the non-presupposed reading is more salient.

(367) Wenn Peter bemerkt, dass er unrecht hat, wird er es allen sagen.

(368) Wenn ich bemerke, dass er unrecht hat, sage ich es allen.

If the truth of the fact depends on its being known by the speaker, it follows naturally that the worlds in which he becomes aware of the fact are equivalent to the worlds in which it holds. We can capture this insight if we assume that there is an anaphoric reading of mood under certain factive predicates, namely all semi-factive predicates, for instance *bemerken, erfahren* and marginally *wissen.* This means that we have to coindex the world variables of the antecedent and the complement clause. (This does not necessarily depend on first person — we may assume that a less informed speaker may rely on the knowledge of a well-informed individual, see below.)

(369) From all worlds w' maximally similar with w_0 in which Peter notices that he is wrong in w', it follows that he will confess it to everyone in w'.

Thus, if we interpret mood as indexical mood, we get the factive reading. If we interpret mood anaphoric, we get the semi-factive reading. In fact, this effect can be reduced to a scope effect. If the world variable (and the whole complement clause) is interpreted outside the scope of the conditional, it is factive. If it is interpreted within the scope of the conditional and is interpreted anaphorically (bound by the conditional), it is semifactive.

Similarly, a clause containing a factive predicate including its complement may be in the scope of an epistemic modal.

(370) Vermutlich ärgert sich Meier, dass sein Sohn eingezogen wird.
[= Reis (1977), (100)a]

This example has two readings. First, it may be that the complement clause is true but that this fact is not the reason for Meier's annoyance. In this case,

the complement clause is not in the scope of *vermutlich*. *Vermutlich* may, like an epistemic modal quantify over worlds. Mood in the complement clause would be interpreted indexical, independently from the quantifier. Second, it may be that the complement clause is part of the speculations. We get this reading when we interpret the clause in the scope of *vermutlich*.

If we consider counterfactual conditionals, this is more obvious:

(371) Wenn er bemerken würde, dass sie unglücklich ist, wäre er sicher traurig.

Example (371) has two readings, a factive and a semi-factive reading. As anaphoric mood is optional in German, mood does not have to agree in its morphosyntactic features in an anaphoric reading — this is optional in German. Consequently, if there is feature agreement, we expect an unambiguous semi-factive reading. This is borne out. All occurrences of morphosyntactic irrealis mood in (372) are anaphoric, i. e. featureless at LF. There is no factive reading of (372).[7]

(372) Wenn er bemerken würde, dass sie unglücklich wäre, wäre er sicher traurig.

In sum, factive complements are interpreted indexically if they have wide scope over the conditional. The world variable in semifactives is interpreted below the conditional and is anaphoric to the world variable in the consequent.

There is a related phenomenon which may be explained on the same grounds. In this case, we have to interpret the subjunctive not as a conditional but as an irrealis.

(373) Ich wüsste nicht, dass er hier wäre.

Here, logically, the presupposed fact is a sufficient and necessary condition for its being known by the speaker. He can only know something which is true, and what is true (in his eyes) will be known to him. Because of this effect, there are particular readings of cognitive factives with subjunctive II in the matrix. With the condition of being known, we get a logical

[7] Again, we could interpret subjunctive mood as indexical here. This has quite an odd interpretations though, and we expect two different sources of the irrealis mood comparable to a sentence like (327).

biconditional which intuitively has to be evaluated in the same doxastic worlds.

(374) Ich wüsste nicht, dass er schon hier wäre/is.

(375) Wenn er nicht da ist, dann weiß ich auch nicht, dass er da ist.

(376) Wenn ich nicht weiß, dass er da ist/wäre, dann ist er auch nicht da.

Sentences like (374) have a particular pragmatic effect. The complement is false. This is unexpected because *wissen* is a factive predicate. As mentioned above, the pragmatics of (374) could be paraphrased as 'If he had been here, I would know it. But as I am not acquainted with a situation s in which he has been here, s must be false.' This meaning arises only under certain circumstances, i. e. the following requirements have to be met:

a) subjunctive II in the matrix is required. (#Ich wusste nicht, dass er hier gewesen ist/wäre.)[8]

b) subjunctive II in the embedded clause is not obligatory but alternatively possible:

   (377) Ich wüsste nicht, dass er hier ist/wäre/*war.

c) First person (singular) subjects support this reading, but third person subjects are marginally possible.

   (378) ?Er wüsste nicht, dass er hier gewesen wäre.

The analysis I propose here considers the embedded mood as anaphoric to the subjunctive II in the matrix. It can be paraphrased by 'it is not the case that I know that he was here.' There is another common idiom in place of *Ich wüsste nicht*, namely *nicht, dass ich wüsste*. This is an ellipsis of *Es ist nicht der Fall, dass ich weiß, dass...* which is equivalent to (374). The intuition behind this is that there is a causal relation between the knowing and the fact.

(379) If he is here, then I know (that he is here).

[8] For reasons which are not clear to me, it has to be the synthetic subjunctive II. A paraphrastic form with *würde* does not have this reading (#Ich würde nicht wissen, dass er hier gewesen wäre.), perhaps because *würde*-paraphrases are always conditional and not simply counterfactual.

(380) $\alpha \rightarrow \beta$

(381) $\neg\beta \rightarrow \alpha$

If there is a causal relation between the fact and the knowing, i. e. a 1:1-correspondence between facts and knowledge in a omniscient speaker, then (381) holds as well. If presuppositions are the speaker's beliefs, then the speaker will be omniscient with respect to his own presuppositions.

(382) Wenn ich nicht weiß, dass er hier ist, dann ist er auch nicht hier.

Another piece of evidence for my claim that mood is bound in these examples comes from negative polarity items (NPIs). NPIs are licensed under propositional predicates with negated matrix sentences:

(383) Er glaubte *(nicht), dass sie auch nur einen Finger gerührt hatte.

(384) Er vermutete *(nicht), dass sie auch nur im Geringsten Lust dazu hatte.

Complements of factive predicates normally do not license NPIs under matrix negation. In factive contexts, only negation in the embedded clause can license a negative polarity item.

(385) *Er bemerkt/bedauert (nicht), dass sie auch nur einen Finger rührt.

(386) *Er bemerkt/bedauert (nicht), dass sie auch nur im Geringsten Lust dazu hat.

(387) Er bedauert/bemerkt, dass keiner auch nur einen Finger rührt.

(388) Er bedauert/bedauert, dass sie nicht im Geringsten Lust dazu hat.

In *wüsste nicht*-sentences of the type like (374), this is different:

(389) Ich wüsste nicht, dass er auch nur einen Finger für sie rührt/rühren würde.

(390) Er bemerkt nicht, dass sie auch nur einen Finger rühren würde.

These sentences are more acceptable if we use counterfactual mood in the matrix as well (optional feature agreement enforces the anaphoric reading):

(391) Er bemerkte nicht, dass sie auch nur einen Finger rühren würde.

This shows that mood in *wüsste nicht*-constructions is anaphoric because of the 1:1 relation between the knowing and the truth of the complement.

Cases like (392) are similar. Again, the infinitive complement is possible because the anaphoric mood may be expressed by an infinitival clause as well. Recall that usually, cognitive predicates are bad with infinitival complements. In the anaphoric reading, however, they are perfectly acceptable.

(392) Ich erinnere micht nicht, sie geweckt zu haben.
Ich erinnere mich nicht, dass ich sie geweckt hätte/(#habe).

Pragmatically, the speaker — via anaphoric mood — indicates that there is a causal relation which he denies hlding holds in the actual world: If I had woken her, I would know it. If I do not remember having woken her, I doubt I woke her.

This is also the case for questions:

(393) Hast du bemerkt, dass er sich irgendwie anders verhält?

If the addressee is considered to be informed by more reliable knowledge, mood has to be interpreted anaphorically. If both the addresse and the speaker have access to the same basis of reasoning, we tend to interpret mood as indexical. Again, NPIs are licensed on this reading. The NPI is ungrammatical on the factive reading.

(394) Hat er (etwa) auch nur einen Finger gerührt?

(395) Hast du (etwa) bemerkt, dass er auch nur einen Finger gerührt hat?

I have shown that treating mood as a variable allows us to explain many facts about conditionals. Mood in the antecedent of a conditional is anaphoric. If a factive complement is embedded in the antecedent, then the world variable of the complement clause may either be interpreted as indexical or anaphoric. The anaphoric reading has special effects which correlate the knowing and the being-true in the same worlds. This particular anaphoric reading permits infinitival complements which usually are unacceptable under cognitive predicates.

Presuppositions in the consequent

What about presuppositions in the consequent of a conditional?

Before I turn to my proposal, let me consider a pragmatic-based account for presuppositions.

Heim (1992), who partly follows Karttunen (1974), presents an analysis where meaning is Context Change Potential, i. e. a function from context

sets to contexts sets, with a context set being the set of worlds compatible with what the participants take for granted in a conversation. The context c initially contains the set of all possible worlds. If an assertion is uttered, the context will be reduced to all possible worlds where this asserted proposition holds.

(396) For any context c, c + *it is raining* = {w ∈ c: it is raining in w}
[= Heim (1992), (5)]

Under this view, a fact is a presupposition and does not differ from a proposition ontologically. A presupposition is a proposition which is part of the common ground (or may be accomodated to be part of the common ground.) A sentence carrying a presupposition can only be admitted if the context satisfied the presupposition. For example, (397) can have a Context Change Potential iff the context satisfies that John has a cat:

(397) John's cat is hungry.

(398) c + *John's cat is hungry* is defined iff
c ⊆ {w: John has a unique cat in w};
where defined, c + *John's cat is hungry*
= {w ∈ c: John has a hungry cat in *w* } [= Heim (1992), (7)]

Heim, Karttunen (1974) and Stalnaker (1974) the projection problem upside down: 'The best solution to the projection problem is to do away with it. The moral of this paper is: do not ask what the presuppositions of a complex sentence are, ask what it takes to satisfy them.' (Karttunen, 1974).

Let us consider indicative conditionals first. What we need is a story about how the presupposition in the antecedent is satisfied. The *wenn*-cases are a special case of a more general problem. Gazdar (1979) is concerned with sentences like (400):

(399) Johns ältestes Kind ist blond. (presupposes: John has children)

(400) Wenn ..., hat John's ältestes Kind blonde Haare.

While the first sentence indisputablly presupposes that John has children, what about the conditional in (400)? It is far from trivial what happens there. It depends on the antecedent whether the presupposition in the consequent obtains or not:

(401) Wenn John's Frau blond ist, hat John's ältestes Kind blonde Haare.

Example (401) seems to presuppose that John has children. In the admittance conditions view, it is easy to imagine this sentence in a conversation where it is part of the common ground that John has children and a wife but it is unknown what their hair color is. Since an indicative conditional as its context set (the common ground at a context) contains the same propositions as in the actual world, the presuppositions of (401) may be satisfied easily.

The crucial point of the accounts of Heim and Karttunen is that it is not helpful to ask why the complex sentence projects a presupposition but to ask why the presupposition in the consequent can still be satisfied. Heim (1992) shows that an indicative conditional 'inherits' all presuppositions in the common ground. The common ground at this context contains all propositions in the hypothetical situation which are in the actual situation plus the antecedent:

(402) $c + \textit{if}\ \phi,\ \psi = \{w \in c\text{: } Sim_w(c + \phi) + \psi = same\}$
[= Heim (1992), (36)]

This explains why sentences like (403) are grammatical:

(403) Wenn Anna Kuchen isst, kann *auch* Petra davon probieren.

The presupposition of *auch* that there is some salient individual other than Petra which may take a piece of the cake is satisfied in the antecedent. The antecedent is 'needed' for the presupposition of the consequent. This phenomenon is also known from pronouns in donkey-sentences:

(404) If a farmer owns a donkey, he beats *it*.

So far, this is a story about the satisfaction of presuppositions of the consequent within the conditional. But what about the presupposition of the complex clause? The antecedent may also exclude explicitly that this proposition is presupposed by the complex sentence — it is filtered out:

(405) Wenn John Kinder hat, ist sein ältestes Kind blond.

This example, in contrast to (399), does not presuppose — as a whole! — that John has children. In Heim (1992), this is because the common ground

contains all maximally similar worlds to the actual world $\text{Sim}_w(\text{c} + \phi)$ which is a subset of $\text{c} + \phi$.

For factive complements in the consequent of an indicative conditional, this means that the presupposition is satisfied *locally* but not presupposed by the whole compound sentence.

(406) Wenn Anna einen Kuchen backt, bemerkt Peter sofort, dass Anna einen Kuchen backt.

This is also the case for *wenn*-complements.

(407) Peter bemerkt sofort, wenn Anna einen Kuchen backt. ($\approx$ (406))

(408) Peter bedauert, wenn er Anna kränkt.

The interesting thing about (406) and (407) is that the complement is not presupposed. We will see that this is because mood is anaphoric to the matrix mood, hence it is not indexical. I assume that mood in *wenn*-clauses is necessarily anaphoric. Only *dass*-clauses allow the world variable to be interpreted indexically. This is more apparent in counterfactual conditionals.

In counterfactual conditionals, the context is not empty, but according to Heim (1992), it is a revision of the common ground. It contains the subset of propositions in the common ground minus some of them.[9] The Context Change Potential for counterfactual conditionals looks like this:

(409) $\text{c} + \textit{if } \phi \textit{ would } \psi = \{ w \in \text{c}: \text{Sim}_w(\text{rev}_\phi(\text{c}) + \phi) + \psi) = \text{same} \}$ [= Heim (1992), (62)]

For cases where the presupposition of the consequent is equivalent to the antecedent, this definition allows us to treat potentialis and counterfactual conditionals parallel to indicative conditionals. The presupposition that Anna bakes a cake is contributed by the antecedent and thus the presupposition is satisfied locally.

What can we say about these phenomena from a mood as a variable account? I have mentioned above that mood in *wenn*-clauses is necessarily anaphoric. This is visible because indicative and subjunctive II are interchangeable in *wenn*-clauses. Crucially, it is anaphoric to the matrix mood headed by a conditional and not by any binder provided by *bemerken* (which would entail that it is modal PRO).

[9] Which of them are suspended? Heim assumes that the result is always the least informative for this context.

(410) Peter würde sofort bemerken, wenn Anna einen Kuchen backen würde/backt.

The fact that the antecedent is equivalent to the complement guarantees that the presupposition will be satisfied no matter what the presuppositions in the actual world are.

With respect to the presuppositions of compound sentences, the crucial point is whether the presupposition is satisfied by the antecedent (or entailed by the antecedent) or whether it is satisfied by the common ground at the context before the conditional. Everything which is entailed in the antecedent blocks accommodation which would be possible without these entailments. If it is different, the presupposition obtains:

(411) Peter würde bemerken, dass Anna krank ist (wenn er aufmerksamer wäre).

If zero mood in *wenn*-complements is zero anaphoric, an infinitival complement should be able to do the job as well. This is borne out:

(412) Peter würde bemerken, von Anna betrogen zu werden.

Of course, the proposition expressed in the infinitival complement in (412) is not presupposed. This is because mood in the complement is interpreted as an anaphoric mood. It is anchored to conditional worlds which, in this case, are counterfactual worlds. The fact that in conditionals, mood may be anaphoric to mood in the *if*-clause, accounts for the fact that infinitival complements are much more acceptable in counterfactuals (which are mostly conditionals) than in non-conditional sentences:

(413) ?Peter bemerkt, von Anna betrogen zu werden.

With the inherently generic/quantified *lieben* (see Portner, 1992, for inherently quantified eventive predicates), the *dass*-complement is purely factive while *wenn*-clause and infinitival complement have equivalent truth-conditions. This is the case because these predicates are compatible with quantified events, i. e. they do not select for single definite events but for sets of events. For every shopping event e', Peter loves this event e'. The equivalence of the two events is only ensured if the shopping events and the corresponding loving events are part of the same possible worlds.

(414) a. Peter liebt es, dass er mit seiner Frau einkauft.

(*sloppy reading)

b. Peter liebt es, wenn er mit seiner Frau einkauft. (quantified)

c. Peter liebt es, mit seiner Frau einzukaufen. (=(b))

This shows that an anaphoric account of mood explains the data of factive predicates and their complements. Mood in a conditional is interpreted anaphorically and thus conditional matrix clauses license infinitival complements in the consequent.

Note that this does not necessarily cover subject clauses in sentences like (i) and (ii).

(i) Es wäre sehr nett von dir zu kommen.

(ii) Mir wäre es ja peinlich gewesen, so unwissend dazustehen.

Infinitival subject clauses of this type are very similar to infinitival object clauses. In the subjunctive cases, they are perfectly acceptable and clearly non-factive. The trickier issue is their behavior in indicative clauses like (i) and (ii):

(i) Es war nett von dir zu kommen.

(ii) Es war mir peinlich, so unwissend dazustehen.

It cannot be denied that the sentences in (i) and (ii) have a factive flavor which — for subject clauses — conflicts crucially with my proposal for object clauses. However, I assume that this factive flavor results from a combination of properties. In this thesis, I argue that factivity has two minor ingredients, first indexical tense/mood which leads to a referential reading of the denoted event, second the non-assertion/presupposition on the part of the speaker. Now let me consider the examples in (i) and (ii). In the present tense counterpart of (i) without the phrase *von dir*, the factive flavor vanishes completely:

(i) Es ist nett zu kommen.

It is now a generic statement on (indefinite) coming-events. Both the past tense and the *von dir*-phrase restrict the set of coming-events to events situated in a contextually salient time in the past with the addresse as the agent. This is conceptually close to a definite event. Second, predicates of this type (*seltsam* 'strange', *erfreulich* 'fortunately', *unfair* 'unfair' and many more) express an evaluation on the part of the speaker. While with

factive predicates, we can report other people's attitudes, with the predicates in question, it is always the speaker's evaluation which is reported. If a speaker reports his/her actual attitude towards an event, it will be likely that he/she assumes that this event holds in the actual world. It is due to the fact that these predicates are not factive/attitude predicates but give the speaker's evaluation 'directly' that the complement can be seen as presupposed. However, these infinitive complements cannot be labeled factive predicates because factivity should obtain in irrealis statements, which it does not with these predicates as shown in (i). When we compare the data in (i) with their finite counterparts, it becomes clear that finite clauses remain factive under matrix irrealis:

(i) Es wäre ja sehr nett von dir, dass du kommst (wenn du nicht nur aus Höflichkeit kämst).

(ii) Mir wäre es ja peinlich gewesen, dass ich so unwissend dastand (wenn mir die Sache nicht völlig egal gewesen wäre).

For these reasons, the *prima facie* counterexamples can be seen as further support for my hypothesis that (a) infinitive complements are never factive, (b) factivity has (at least) speaker-presupposition and the denotation of a definite event as necessary conditions.

3.4.2 A revised view of pragmatic presupposition

In the preceding section, it was shown how a variable mood approach can account for many central facts in presupposition projection in conditionals. In this section, I will present a more general approach of (factive) presupposition which does not rely on the interlocutors' mutual knowledge. For this, I follow Abbott (2000) in her revised pragmatic presupposition analysis. Her idea is quite appealing and simple: 'I propose that grammatical presuppositions are a consequence of a natural limit on how much can be asserted in any given utterance, where what is asserted is what is presented as the main point of the utterance — what the speaker is going to record as constributing to the discourse.'(Abbott, 2000, p. 1431) What is assertion? Abbott assumes that an assertion is an atomic proposition, which will typically be the root clause (but not necessarily). We can presuppose new information, but a speaker should not presuppose new information if he can assert it. Similarly, Simons (2006) holds that an utterance presupposes a proposition

p 'if it is not part of the speaker's primary communicative intention to convey p'. Additionally, the hearer will have to accept the presupposition in order to 'make sense' out of the utterance.[10] I will adopt this view and implement it under a formal treatment of speech acts. I assume that root clauses are headed by a kind of illocutionary operator (or a sentence mood operator) like ASSERT or COMMAND (Krifka, 2001). This illocutionary operator combines with a proposition (or a sentence radical, as Krifka put it) and will turn the proposition into a speech act.

I assume that indexical mood in subordinate clauses has wide scope over the illocutionary operator. LF-movement of factive complements ends up in a position above the illocutionary operator. Under this view, presupposition is non-assertion due to LF-movement, which itself requires indexical mood and tense.

The central argument for the claim that factive complements are interpreted outside the scope of an illocutionary operator comes from Krifka (2001). He is concerned with quantification into questions. For the interpretation of (415), *which dish* is raised and has scope over the speech act.

(415) Which dish did every boy make?

(416) [every boy]$_i$ λt$_i$ [QUEST(which dish did t$_i$ make)]
[= Krifka (1999), 52a, 60]

Speech acts are not islands for movement. Topics are a good example for overt movement:

(417) As for Al, Bill and Carl, which dishes did they make? [= (61)a]

He notices (with reference to Szabolcsi, 1993) that in embedded questions like (418), wide-scope interpretations of non-universal quantifiers are not possible with verbs like *wonder, ask, want to find out*:

(418) Doris wondered [*Quest* [which dish Bill made]].

(419) Doris wondered [every guest λt$_1$[*Quest* [which dish t$_1$ made]]]

(420) *Doris wondered [most guests λt$_1$[*Quest* [which dish t$_1$ made]]]
(*pair-list-reading)
[= Krifka (2001), (104)]

[10] This is new in Simons' account in contrast to Abbott.

Intensional predicates may embed a question act. They allow for pair-list-readings for embedded quantifiers as in (419) but not for non-universal quantifiers as in (420) because the latter are not defined for quantification into questions acts (for details see Krifka, 2001). Important for us is that extensional predicates like *find out* do allow for this:

(421) Doris found out which dish most guests made. (pair-list reading)

Krifka (2001) assumes that this is because the complements of extensional predicates are type-shifted from question acts to the set (sum) of true propositions (since in his approach based on Groenendijk & Stokhof, 1984, , the complements of extensional predicates denote (the set of) true propositions). If a question act appears as the complement to an extensional predicate, this will be coerced into a proposition. In his framework, this is done by the operator True Answer TA:

(422) $\text{TA}(\text{QuestAct}) = \bigoplus \{p \mid p \text{ is a true answer of QuestAct}\}$

(423) Doris found out [TA[*Quest* [which dish Bill made]]]

It does not matter at this point that Krifka (2001) assumes the complements of extensional predicates to be (sets of) true propositions. The important thing is that they are never headed by a speech act.

Under this view, presuppositions do not have to be satisfied by the common ground (although they have effects on the common ground, of course). It is easy to introduce new discourse referents in this way — presuppositions are not part of the assertion. Reis (1977), with a similar definition based on Stalnaker (1973), calls this an 'essential pragmatic position'. I follow Abbott and Simons in their assumption that presuppositions are not only speaker's beliefs but beliefs which he does not assert for some reason. In other words: presuppositions do not have to do much with the common ground, but are propositions which the speaker does not want to call into question (as he would have done by asserting the proposition). The reasons for this may be to avoid redundancy — in the case of discourse-old information — or to add information which is regarded as easy to accommodate or which may be 'hidden' in the utterance for some pragmatic reason. In order to support this view, I will now show that presupposition does not correlate with givenness.

3.4.3 Focus, givenness and presupposition

Predicates which are ambiguous between factive and non-factive readings tend to be factive when the predicate is focused[11]:

(424) Peter wird GLAUBEN, dass Anna schwanger ist.

As Krifka (2006) notices, deaccentuation of a phrase corresponds to givenness. Accentuation of another constituent may trigger a given-reading for the deaccentated constituent. So maybe givenness is responsible for the effect in (424)? It seems that non-givenness is not compatible with factive complements, as in (a) in contrast to (b)

(425) Mensch, weißt du schon, warum Frank so sauer ist?

a. # Weil alle ihm verheimlicht haben, dass Anna verHEIratet ist.

b. Anna ist verHEIratet, und alle haben es Frank verheimlicht.

Of course, the fact in the complement may be discourse-new in the case of accommodations. This holds generally, and the most illustrative examples are embedded announcements like (426).

(426) Wir bedauern, dass die Universitätsbibliothek heute geschlossen ist.

Presupposed propositions are usually given. A discourse-new proposition with prosodic marking like in example (425a) is odd with factive predicates.[12] The crucial point is now that the opposite is not true: though presupposed propositions are usually given, a given proposition under a propositional predicate does not make the complement factive. Recall why this is important for my argument. If we have a predicate which is ambiguous between a factive and a propositional reading, emphasis on the control predicate may support a factive reading but this is an epiphenomenon:

(427) Peter GLAUBT, dass Anna schwanger ist. (± factive)

We can easily construct contexts where it is given that Anna is pregnant — 'given' indicating that this proposition has already been introduced in the common ground, not that is is presupposed to be true.

(428) Schon gehört? Alle Freundinnen von Anna sagen, dass sie schwanger ist. Und nun glaubt auch ihr FREUND, dass Anna schwanger ist.

[11] Contrast focus not considered.

[12] For a totally distinct notion of givenness and presupposition, see Reis (1977). I will consider only cases with given but presupposed propositions.

In the last sentence of this scenario, 'Anna is pregnant' is given. Still, it is not presupposed. Factivity and givenness are disjoint notions. Since focus and prosodic marking of givenness are discourse-pragmatic notions, presupposition must have a different source. If it were merely the stress on *GLAUBT* in sentences like (427) that makes the proposition backgrounded and that triggers a factive reading, this reading should exist also with infinitival complements. This is not the case.

(429) Peter erzählt seiner FREUNDin, dass er Anna kennt.

(430) Peter erzählt seiner FREUNDin, Anna zu kennen.

Both complements are backgrounded because *FREUNDin* is focused. *Erzählen* is ambiguous between a factive and a propositional predicate[13]. If backgrounding were sufficient for a factive reading, (429) or (430) should exclude non-presupposed readings. But givenness is disjoint from presupposition:

(431) Peter erzählt immer herum, er würde Anna kennen. Nun erzählt der Idiot auch noch seiner FREUNDin, dass er Anna kennt.

Infinitival complements are not factive, even though they are given:

(432) Alle denken, dass sie Peters neue Freundin Anna nicht kennen. Auch Paul ärgert sich sehr, Anna nicht zu kennen. Dabei hatte er sie schon zweimal dabei, bloß hat niemand gewusst, dass SIE die Glückliche ist.

Correlates (like ordinary pronouns) have a discourse-pragmatic function. They indicate that the corresponding fact (or proposition) is already part of the common ground. Very often, facts are part of the common ground. This ought not be confused with a necessary condition of factivity — the correlate does not involve any interpretive differences:

(433) Peter bedauert (es), dass er Anna gekränkt hat.

Contra Kallulli (2006) who explicitly claims this, I assume that correlates with propositional complements do *not* trigger factivity but that the factive flavor is an epiphenomenon of givenness. This is different with embedded announcements. It is odd to have a correlate in a sentence like (426). The reading as an embedded announcement disappears in (434).

[13]For example, in the factive reading it may take wh-complements: *Peter erzählte ihr, wer alles gekommen war.* Is is clearly propositional in sentences like *Peter erzählt immer, dass er arbeitslos sei, dabei stimmt das gar nicht.*

(434) # Wir bedauern es, dass die Universitätsbibliothek heute geschlossen ist.

The difference between givenness and (semantic) presupposition can be observed with embedded announcements:

(435) Wir haben erfahren, dass unsere Tochter ein Störenfried ist.

This example is felicitous also when the denotation of the complement was not part of the common mutual knowledge. If it were, embedded announcements should be equally fine with correlates but this is not the case.

(436) Wir haben es erfahren, dass unsere Tochter ein Störenfried ist.

In clear contrast with (435), example (436) is felicitous only when we can assume that the hearer already has knowledge of the presupposed fact. Hence, in (435), the fact is presupposed but not given. A correlate has the discourse-pragmatic effect of referring to something which is given in the common ground.

There are good reasons to assume that scrambled CPs have a similar effect (see Pütz, 1986). Hence, scrambled CPs may occur in the middle field (in a position above the canonical argument position):

(437) Wir haben, dass unsere Tochter ein Störenfried ist, erst gestern erfahren.

This example is only felicitous when the presupposed content is given. Again, this effect should not be confused with factivity. Thus, CPs in the middle field or topicalized CPs have to do more with givenness than with factivity. This corresponds to the pragmatic effect of correlates. It may disambiguate a factive from a propositional reading, but it is no trigger, i. e. it does not change the semantic interpretation.

Hence, prosodic marking can only help to disambiguate readings but does not *turn* a propositional complement into a presupposed one by backgrounding or any other discourse-pragmatic means. It may support a factive reading but only when this factive reading is accessible for semantic reasons.

3.5 Summary

In this chapter, I have shown that in contrast to attitudes, factive predicates do not bind the tense and world variable of their complements. Usually,

mood and tense receive an indexical interpretation; furthermore, it may be anaphoric to a superordinate tense and mood, akin to relative clauses where tense and mood may receive an anaphoric or indexical interpretation. Both the indexical and the anaphoric uses share the essential property that factive predicates do not provide lexical binders for mood and tense of their complements.

Ontologically, facts are distinct from (true) propositions. I have identified them with (definite) situations. If we assume that emotive predicates involve an attitude-layer (as the experiencer has to have a mental representation of the fact he has an emotional attitude towards), we can in Kratzer's (2002) framework relate situations and the propositions which are exemplified by them.

Technically, factive complements denote definite situations/events. At LF, the event variable is moved into a position above the matrix clause which is possible due to indexical tense and mood. Under this approach, it is possible to cope with presupposition projection. Depending on scope differences, the world variable in the factive complement may either be anaphoric to the world variable in the conditional consequent or be interpreted indexically in a position above the conditional. Assuming that every clause is headed by an illocutionary/speech act operator, the event variable moves into a position above this speech act operator. In Abbott (2000), non-assertion is the precondition for presupposition. Thus, presuppositions are characterized by their not being part of the assertion. I have shown that indexical mood and tense, in turn, are a precondition for non-assertion. Prosodic effects are not triggers for presuppositions but may disambiguate factive from non-factive readings which are provided by the semantics of the complement.

Part II

Syntax

Chapter 4

The syntax of complement clauses

I have argued in the preceding chapter that semantically, intensional and extensional predicates differ with respect to the semantic selection of their argument. Propositional complements have an open tense and mood variable and thus denote propositions, while factive complements carry indexical mood and tense and thus are eventive. I will now show that there are good reasons to assume that propositional and factive complements differ syntactically as well. The most notable difference is the opacity of factive clauses for extraction which stands in clear contrast to the transparency of propositional CPs.

The distinction between factive and non-factive predicates is basically a semantic distinction, correlating with tense and mood. I will argue that the differences between factive and propositional CPs can be traced back to m-selection. Attitudes m-select their complement, factives do not.

Thus, in this section, I will be concerned with the syntactic properties which distinguish factive CPs from propositional CPs. After a section on propositional CPs in 4.1, I will give explanations for their different behavior in section 4.2.1. Infinitival propositional complements will be considered in section 4.3.

4.1 Propositional CPs

In the following list, the essential syntactic properties of propositional CPs are itemized.

Extraction: There is extraction out of CPs[1] as shown in (1) and (2).

(1) Wen$_i$ hast du geglaubt, dass Paula t$_i$ getroffen hat?

(2) [Über wen]$_i$ hast du gedacht, dass sie t$_i$ gesprochen hat?

Principle C effects: The examples in (3) and (4) show that the indirect object in the matrix clause c-commands the embedded clause as the proper name in (4) may not be c-commanded by a coreferential pronoun.

(3) Seine Chefin versicherte Peter$_i$, dass er$_i$ die Sache gut gemacht hatte.

(4) *Seine Chefin versicherte ihm$_i$, dass Peter$_i$ die Sache gut gemacht hatte.

Binding data: Under the assumption that c-command relations are responsible both for binding and principle C effects, binding data confirms the conclusions from principle C effects.

(5) [Jeder Mann]$_i$ glaubt, dass er$_i$ toll ist.

(6) Ich glaube [jedem Verkäufer]$_i$, dass er$_i$ ehrlich ist.

For the purposes of this thesis, the crucial property is the fact that attitudes are transparent for extraction because, as we will see, factive CPs are intransparent for extraction.

For complement clauses to the right of V, as in (7), there are three different ways to account for the position of CP.

(7) Peter hat [geglaubt$_V$ [$_{CP}$ dass Anna schwanger ist]]

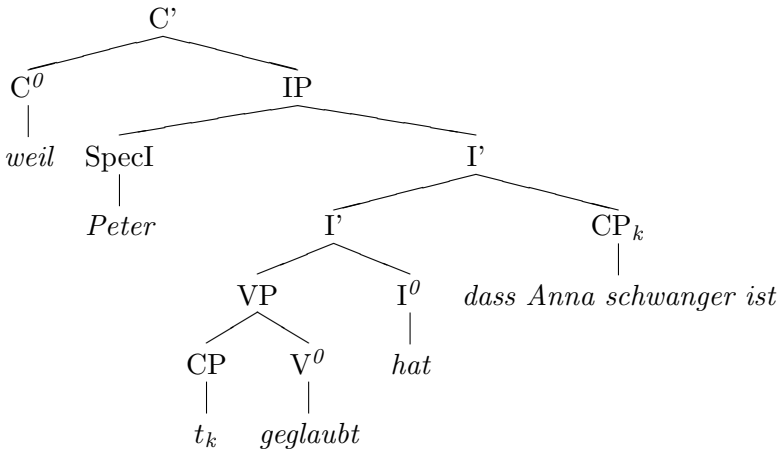
The first approach is to assume that they are extraposed, i. e. they originate in VP and are moved to the right. This is the traditional view as proposed by Büring & Hartmann (1995). In the second possible analysis, there might be

[1] For the moment, I will regard only complement clauses of propositional predicates.

an argument position of V especially for sentential arguments at the right of V (see for instance Haider, 1995). Thirdly, complement clauses might be base-generated adjoined to some projection of the matrix clause (as in Barbiers, 2000). Since we will see that the syntactic differences between attitudes and factives boil down to the (im)possibility of extraction out of the subordinated CP, the origin of the propositional CP is not essential for this discussion. Thus, I will adopt the traditional movement account which assumes movement out of the position at the left of V^0 as shown in (9).

(8) Peter hat geglaubt, dass Anna schwanger ist.

(9)



This approach is compatible with the binding data and the principle C effects. I will show in section 4.4 that there are also CPs which have to be analyzed as adjuncts and which receive a factive interpretation.

4.2 Factive complements

We have seen in section 3 that factive predicates select for single situations while propositional predicates select for propositions (or more precisly intensionalized properties of time). We will see that binding of mood in the complement syntactically presupposes that there is a c-command relation between the matrix IP and the complement (cf. Heim & Kratzer, 1998). I will argue that factive CPs not being m-selected has the effect that they are not transparent for extraction.

In the following list, the most important syntactic differences between factive complements and propositional complements are itemized. Not all of them will be considered essential, some are epiphenomena from other

pragmatic or semantic sources.

– As mentioned, factive complements disallow extraction.

(10) *Wohin bemerkt Peter, dass Anna gefahren ist? (factive)

(11) Wohin glaubt Peter, dass Anna gefahren ist? (propositional)

The extraction data will be addressed in the first section here.

– In English, factive predicates can have POSS-gerunds as complements:

(12) Everyone ignored Joan's being shy. (factive)

In German, the best candidate for a fact-denoting phrase in the nominal domain is a nominalized infinitive. However, I will not be concerned with nominalizations here.

(13) Jeder ignorierte Joans Schüchternsein.

(14) ?Jeder ignorierte Joans Schüchternheit.

There has been a lot of work on gerunds in English since Vendler (1967). Still, it is far from clear how German data fits into the picture.

– Factive complements are necessarily *that*-complements. In English, *that*-drop is disallowed with factive predicates:

(15) Bill revealed *(that) Jane voted for Reagan. (factive)

(16) Mary thought (that) Bill was anxious to leave. (propositional)
[= Melvold (1991), 6b,c]

In German[2], V2-complements cannot be complements of factive predicates:

(17) *Karl entdeckt, das Café hat geschlossen.

(18) Karl denkt, das Café hat geschlossen.

[2]Although mentioning these points within one item, I do not claim that *that*-drop in English and V2 in German reflect the same structure. A good counterexample is:

(i) *Ich bin mir sicher, du hast ihn gesehen!

(ii) I am sure you saw him!

We will see in section 4.4 that the difference between V2 and factive complements follows from semantic differences.

– According to Barbiers (2000), there are distributional differences. Factive CPs can be scrambled into the middle field more easily than propositional CPs:

(19) Peter hat [$_{CP}$ dass er krank ist] lange Zeit bedauert. (factive)

(20) ??Peter hat [$_{CP}$ dass er krank ist] lange Zeit geglaubt. (propositional)

– Furthermore, only (cognitive) factive predicates embed wh-clauses while most propositional[3] predicates do not[4]:

(21) Er ahnte plötzlich, wer da angefahren kam. (factive)

(22) *Er glaubte ganz sicher, wer da angefahren kam. (propositional)

Boer (1978) notices that non-factive predicates (for instance *verba dicendi*) become factive with a wh-complement. He strongly correlates factivity with the property of wh-selection.

[3]Marga Reis, p.c., has some interesting counterexamples, for instance *davon abhängen*:

(i) Es hängt davon ab, was man macht.

[4]The semantics of wh-facts is interesting but cannot be covered here. To provide a brief sketch, the correct semantic representation should capture that we get a disjunct set of facts which — parallel to propositional wh-clauses — are all possible substitutes ('answers') for the clause. The object of *regret* is thus not a fact but a set of facts. It cannot be used appositive to *the fact* in (i):

(i) *Johannes bemerkt die Tatsache, wen er eingestellt hat.

Still, it refers to definite situations and can thus be the complement of factive predicates. The meaning in (i) captures that it denotes a definite situation without reference to all participants of the situation.

(i) Johannes bemerkt, wen er eingestellt hat.
Johannes bemerkt, {dass er Peter eingestellt hat, dass er Maria eingestellt hat, dass er Anna eingestellt hat}

(ii) ∀x [Johannes bemerkt, dass er x eingestellt hat]

For a proposition-based account, see Boer (1978). For a pragmatic, optimality theoretic solution see Sæbø (2007).

(23) John told me that Tom stole the cheese.

(24) John told me who stole the cheese.

[= Boer (1978), (9), (10)]

– Sometimes, it is stated that correlates tend to make a complement 'more factive' (for instance Schwabe & Fittler, 2008, or Breindl 1989, p. 246f):

(25) Peter sagt, dass er Maria liebt.

(26) Peter sagt es, dass er Maria liebt.

We have already seen that this is a pragmatic effect.

The most remarkable and robust difference between factive and non-factive CPs is their islandhood for extraction.

It was Erteshik-Shir (1973) who showed for the first time that extraction from factive complements is much less acceptable than extraction from propositional complements.

(27) [Ein Buch]$_i$ glaubt Peter, dass er t$_i$ verlegt hat. (propositional)

(28) *[Ein Buch]$_i$ bemerkt Peter, dass er t$_i$ verlegt hat. (factive)

The extraction effects are generally subsumed under islands effects. Islands block antecedent-trace dependencies, thus making extraction impossible. The grammaticality judgments differ intrasubjectively and crosslinguistically. Judgements (for instance from Rizzi, 1990, see the German data here) suggest that complement clauses allow the extraction of (referential) PP-arguments in contrast to non-referential PP-arguments. For German, I have difficulties reproducing these judgements. As for myself, it does not make a difference whether we extract wh- or non-wh-phrases, whether we extract nominal or PP-objects: factive complements allow extraction only marginally.

(29) a. ?[Den Mann]$_i$ bemerkt er, dass er t_i gut kennt.

b. [Den Mann]$_i$ glaubt er, dass er t_i gut kennt.

(30) a. ?Wen$_i$ bemerkt er, dass er t_i gut kennt?

b. Wen$_i$ glaubt er, dass er t_i gut kennt?

(31) a. ?[Auf Anna]$_i$ bemerkt Peter, dass er immer t_i warten muss.

b. [Auf Anna]$_i$ glaubt Peter, dass er immer t_i warten muss.

(32) a. ?[Auf wen]$_i$ bemerkt Peter, dass er immer t_i warten muss?

b. [Auf wen]$_i$ glaubt Peter, dass er immer t_i warten muss?

There may be a difference between extraction of adjuncts as opposed to extraction of objects, i. e. between sentences like (31) and (32) in contrast to (33).

(33) a. *[Mit diesem/welchem Mann]$_i$ bemerkt Peter, dass Anna t_i in den Urlaub gefahren ist.

b. [Mit diesem/welchem Mann]$_i$ glaubt Peter, dass Anna t_i in den Urlaub gefahren ist.

Basse (2008) proposes an analysis which explains the difference between object and subject/adjunct extraction. He relies on Chomsky (2001) when he proposes that factive CPs are defective because they lack a Force Projection and therefore lack an intermediate landing site for extraction to a higher clause. The only landing site for long distance movement is the matrix ν^0. Factives can assign accusative case, thus the subordinate wh-object can be drawn to the left edge of the matrix νP. Consequently, the moved wh-phrase ACC-agrees both with the lower and the matrix νP. This can account for the (marginal) grammaticality of object (wh-)phrases. Subjects and adjuncts are excluded as they cannot ACC-agree, since they are nominative or caseless. Propositional CPs are full CPs including ForceP and thus provide a landing site for extraction in SpecForceP.

This explanation has a weak point: extraction of non-accusative objects should be disallowed generally. But (31a) is judged as good or bad as (29a). Hence it is not the accusative case which is essential. It seems as if it does not matter which case is assigned, as long as it has an argument position. *Sich ärgern* 'be annoyed', for example, subcategorizes for an *über*-PP object. Still, it does allow for extraction just as acceptable as *bedauern* 'regret', which takes an accusative NP.

(34) ?Wen$_i$ bedauerst du, dass Peter t$_i$ eingeladen hat?

(35) ?Was$_i$ ärgerte er sich, dass er t_i verloren hatte?

I do not have an explanation for the different grammaticality judgements of adjunct and object extraction. To myself, apart from adjunct extraction

(which is ignored here), however, extraction from factive complements does not show differences in this respect.

Hence, in sum, factive complements disallow extraction[5], and disallow object extraction. Why? This will be the subject of the following section.

4.2.1 Why are factive CPs different?

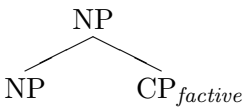
Apart from strictly semantic explanations (for instance Szabolcsi, 1993), there are three general ideas of how do account for the islandhood of factive complements. I tentatively organize them in three groups: approaches which assume an NP/DP-shell above factive CPs (in section 4.2.1), proposals which assume a semantic operator in SpecC of factive CPs (section 4.2.1) and an approach which assumes that locational differences are responsible for the behavior of factive CPs in section 4.2.1.

We will see that apart from the traditional DP/NP-shell view, all these approaches seem to shed some light on the nature of factive complements.

DP/NP-shell

According to the observations in Kiparsky & Kiparsky (1971), with factive predicates we can insert *the fact* before the complement. The paraphrase *the fact* was taken as a starting point and it was assumed that there is a nominal phrase which encapsulates the factive CP as illustrated in (36). This has been argued by Kiparsky & Kiparsky (1971) and many more still rely on this account (for example Ormazabal, 1995).

(36)


(37)


Extraction differences between propositional and factive complements can be accounted for under this approach. The factive islandhood would

[5] We will see in section 5.2 that there is a second explanation for possible extraction from factive complements, namely class-shifting from a factive to an attitude verb. Emotives can be shifted more easily than cognitives:

(i) ?Wen bedauert Peter, dass er gekränkt hat?

(ii) ??Wen bemerkt Peter, dass er gekränkt hat?

then be an epiphenomenon of its being an adjunct to NP ('Complex NP Constraint'). Rizzi (1990) assumes that factive verbs select an NP such that the CP under the NP is protected against the s-selection of V^0. According to the barrier definition adopted from Cinque (1990),

(38) XP is a barrier if it is not directly selected by an X^0 not distinct from [+V].

there are two ways to account for its barrierhood. First, we could hold that factive predicates do not c-select their complement because it is not selected directly. This is the approach Rizzi (1990) takes when he refers to Kiparsky & Kiparsky (1971), and assumes that all factive CPs are headed by a nominal shell. 'Select' means θ-mark in the case of lexical categories and c-select in the case of functional categories. This implies that being a lexical category, the N^0 of the nominal shell heading a factive CP is s-selected, but the 'inner' CP is not c-selected (neither by the lexical V nor by the N). We will see later that we could also make use of a second possibility in the definition of Cinque (1990).

If there was a nominal shell above all factive complements, they should be 'protected' against the Case Resistance Principle (Stowell, 1981, see section 4.1). In fact, factive CPs are at most little more acceptable in the middle field than propositional CPs.

(39) Ich habe erst gestern [dass das Auto kaputt ist] bemerkt. (factive)

(40) Ich habe erst gestern dass das Auto kaputt ist geträumt. (propositional)

This observation conflicts with the assumption that a nominal shell heads factive CPs. If propositional and factive CPs differed in this respect, factive CPs should be at least more acceptable in a position left-adjacent to V than propositional CPs. But there is no difference in the position left-adjacent to V.

Furthermore, the distribution of wh-facts is problematic. Most factives embed wh-complements, and it is likely that their general position corresponds to the one of wh-factives. But if we assume that there is a covert *the fact* heading every factive complement, we cannot explain why this is not possible with wh-facts:

(41) Peter hat bemerkt, wer gekommen ist.

(42) *Peter hat die Tatsache bemerkt, wer gekommen ist.

Thus, the view of an NP/DP shell cannot be sustained. Factive CPs seem to be CPs just like propositional ones. The following approaches locate the differences in the CP type of factive complements.

Semantic features and SpecC

The approaches presented in this section share the assumption that the semantic difference between the factive and the propositional complement should be mirrored somewhere in the syntax. There are two starting points. One may assume that CPs generally are not barriers and find a way to prohibit extraction for factive complements. As an instance of this kind of approach, the appoach by Melvold (1991) will be presented. On the other hand, one may assume that CPs are generally barriers and try to find a reason why propositional CPs are transparent. Prominent promoters of this latter idea are Müller & Sternefeld (1995). De Cuba (2006) also takes this view and argues for a second C-layer in propositional CPs which hosts a semantic operator and makes the CP transparent for extraction.

Under the approach of Müller & Sternefeld (1995), all CPs have a nominal shell. Thus, the idea of Rizzi (1990) of a 'protecting' N-shell for factive CPs does not hold any longer. Their idea is that the N heading a propositional or factive CP can be non-distinct from V.

For Müller & Sternefeld (1995), it need not be justified that factive CPs are opaque, but that a CP under a bridge verb does allow for extraction. According to their definition[6], only constituents in complement positions may be transparent at all. This corresponds to Rizzi (1990) and Cinque

[6]The definition of a barrier according to Müller & Sternefeld (1995) is:

> XP is a barrier for every α included in XP, if (a) and (b) hold:
>
> (i) α does not occupy an escape hatch of XP
>
> (ii) if Y minimally c-commands X, then X is distinct from Y.

This definition implies that every XP which is not a sister of some head becomes a barrier, i. e. every adjunct and every category which occupies a specifier position, for instance *wh*. An escape hatch is defined as follows:

> Escape hatch: α occupies an escape hatch of XP iff α is in an A'-specifier of XP.

(1990). We can make an XP transparent for extraction when its own head is non-distinct from the subordinated head. Recall that for Rizzi, the nominal shell was distinct from V thus making the CP under N non-transparent. Now Müller & Sternefeld (1995) assume that two heads can be non-distinct. Non-distinctness happens when two elements share their index, i. e. when one head is incorporated into the other: VP is not a barrier because inflection is incorporated with the effect that they are co-indexed. IP and C are abstractly co-indexed at LF.

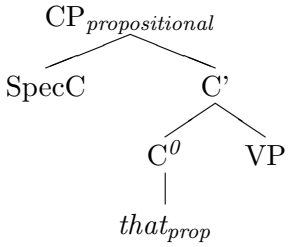
They assume an NP-shell above all finite clauses. In contrast to object clauses under non-bridge[7] verbs, direct object clauses under bridge verbs allow for extraction because (since the matrix verb morphologically (m-) selects the head of the clause) C may incorporate its empty N-head. Then both heads N and C are non-distinct and the CP is no longer a barrier. Whether a control predicate m-selects the N-head or not is a *lexical* property. This lexical difference between factive and non-factive predicates remains the only explanation for the opacity of factive complements.

Do we need an operator in SpecC in order to *block* extraction, or a feature in SpecC in order to *allow* extraction? While Müller & Sternefeld (1995) preferred the second option, the following approach proposes the former. A CP is generally transparent for extraction, but in factive CPs, this transparency is blocked.

Why should transparency be blocked? One idea is to modify the parameters of the C-domain in factive CPs, for instance by assuming a silent operator in SpecC and assuming that there are two homophonous complementizers *that*, and one embedding factive CPs, one embedding propositional CPs. This is illustrated in (43) and (44).

[7] Müller & Sternefeld (1995) assume that the class of bridge verbs, i. e. predicates which embed clauses which allow extraction corresponds to the class of predicates which allows V2 complements. Note that this is not correct, cf. Meinunger (2007) for a detailed investigation of V2 and other non-factive complements. Influence predicates like *ermöglichen* do allow for extraction but never allow for V2. V2 in German certainly differs from complementizer drop in English. I completely agree with the analysis in Meinunger (2007) that V2-clauses are weak assertion as an 'offered proposition' made by the speaker. The fact that it is an assertion made by the speaker which may be associated with a subject/holder's assertion will become important later.

(43)



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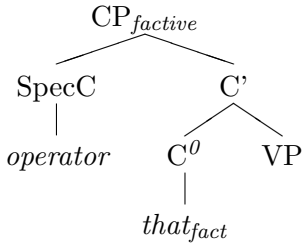


There are many ways to implement this idea. Reducing factive islands to wh-islands, Rooryck (1992) assumes that there is a [+wh] feature in C^0 of factive complements, an idea which cannot be treated extensively here. Instead, I would like to present the approach of Melvold (1991) here because it is based on the interesting idea that factive complements are in some way 'definite'.

Melvold's analysis relates the complements of factive predicates with definite noun phrases both semantically and syntactically. The complements of factive predicates semantically denote events, i. e. they are neither true nor false but refer to an event. The complements of non-factive predicates denote propositions. The event argument of propositional complements is bound by an existential quantifier. In factive complements, on the other hand, the complementizer licenses an iota operator which is part of their indexical function.[8] The operator is hosted in SpecC, thus blocking this position as a landing site for extracted elements. The impossibility of extraction out of factive complement clauses is an effect of this iota operator in SpecC, in analogy to wh-islands where the wh-element blocks SpecC as a landing site. We have seen that it is reasonable to assume that factive predicates select for events or situations instead of propositions. However, it is stipulated that this semantic operator should be responsible for their non-transparency alone.

We have already seen that factives do not embed V2 complements (or, if they do, they lose their presuppositional character). Does this tell us anything about the syntax of factive complements? There are several ap-

[8]Note that this comes very close to my ontology of facts as single situations. The uniqueness condition is put in the syntax in her approach, using the ι operator for the event argument of the embedded predicate. Similarly, in Hegarty (1991), a factive predicate (or, to be more precise, the complementizer selected by the factive complement) binds the event argument of the embedded verb.

proaches which suggest that the non-assertional character of factive complements is mirrored in the syntax.

McCloskey (2005) presents data from Irish English which shows that Subject Auxiliary Inversion is allowed under non-factive predicates like *ask* and *wonder* but disallowed under factive predicates as in (46).

(45) a. I asked Jack/wondered was he illiterate. (Irish English)

b. I asked Jack/wondered what is he like at all. (Irish English)

(46) a. *I found out how did they get into the building. (Irish English, Standard English)

b. *I remember clearly how many people did they arrest. (Irish English, Standard English)

This holds for German as well. Under interrogative predicates, wh-complements can be embedded questions. Wh-complements under factives cannot be embedded questions:

(47) a. Ich frage mich, wen du da angeschleppt hast.

b. Ich frage mich, wen hast du da angeschleppt?

(48) a. Ich weiß, wen du da angeschleppt hast.

b. *Ich weiß, wen hast du da angeschleppt?

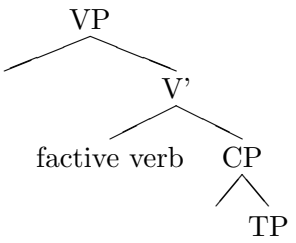
De Cuba (2006) takes the Inversion data from Irish English as reported by McCloskey (2005) as a starting point. He argues that propositional CPs have an extra projection *c*P. The functional head *c* is selected by non-factive predicates which itself selects for a CP.[9]

[9]His approach has one more advantage. McCloskey (2005) reports that it is possible to left-adjoin CPs to non-factive complements but not to factive CPs. He derives this from a general Adjunction Prohibition which disallows adjunction to a phrase which is s-selected by a lexical (open class) head. Since the (inner) CP is not selected lexically, the Adjunction Prohibition is avoided. Factive CPs, in contrast, are selected, and thus factive CPs are subject to the Adjunction Prohibition. Since I can neither confirm nor disprove these observations for German data (see examples given below), I skipp this argument.

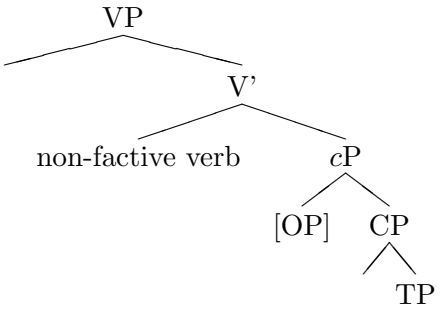
(i) ??Peter bemerkt, am letzten Donnerstag, wen er getroffen hat. (factive)

(ii) ??Peter erträumt sich, nächsten Donnerstag, wen er treffen möchte. (propositional)

(49) Factive complements:



(50) Non-factives:



The cP is responsible for the transparency for extraction since it provides an escape hatch for movement out of the CP. The operator OP serves to 'separate the speaker of the sentence from responsibility for the truth content of the embedded sentence'. Semantically, it is an operator over contexts as proposed by Schlenker (1999).

There is a severe complication for approaches which rest on the embedding of V2-complements with non-factive predicates. In German, V2 complements are adjuncts (see section 4.4), thus I do not see how we could assume that they are selected. Given this, the whole explanation of De Cuba (2006), though conceptually attractive, becomes inapplicable for German.

Haegeman (2006) (contra Zubizaretta, 2001, who assumes an assertion operator in factive complements in order to derive their presuppositional character) assumes that there is no assertion operator in factive complements. If there were, it would be associated with illocutionary force. She says that for English, generally there is a topic position in embedded clauses but not in factive complements (see also Watanabe, 1992):

(51) *John regrets that this book Mary read.

[= Haegeman (2006), (21)a]

For German, the existence of a topic position in embedded clauses is controversial (Frey, 2004, for instance, assumed that there is one). If we accept that there is one, I see no difference between propositional and factive com-

plements.[10]

(52) ?Ich glaube, dass den Mann Peter gestern auch schon gesehen hat.

(53) ?Ich habe gemerkt, dass mit diesem Mann Peter gestern auch schon Streit bekommen hat.

Hence, I do not see a reason to assume that the internal structure in factive complements differs from the one of propositional CPs for German. If there is a syntactic position for illocutionary operators, like ForceP, it might fall together with the C-domain in German. Furthermore, if there is a topic position in the German middle field (see Frey, 2004), it is present in factive complements as well. Thus, a blocking operator is stipulative and not convincing, and neither are the approaches which make the different internal structure of a factive CP responsible for the opacity for extraction. The internal structure of factive CPs corresponds to that of non-factive CPs.

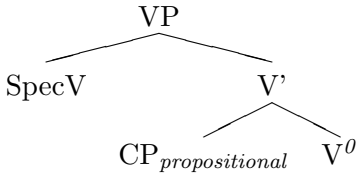
Instead, I follow Müller & Sternefeld (1995) in their explanation: CPs are generally barriers for extraction but they can be made transparent via head-incorporation. We have already derived on independent grounds that propositional CPs are m-selected, since it is a CP marked with the feature [TENSE] which is selected. Therefore, it is no longer a stipulation to assume that factive CPs are not m-selected and for this reason cannot be made tranparent for extraction. Before we come back to their approach, however, let me consider the third approach which assumes locational differences between factive and propositional CPs. In the definition of a barrier (as used by Müller & Sternefeld, 1995), there are two ways to derive the opacity of factive complements. First, the factive CP may not be m-selected. This is supported here. But second, it may not be a sister of V. If it is an adjunct, the opacity would follow automatically. Before moving on to m-selection, let me discuss this second option.

Locational differences

The idea that factive CPs are merged in a position different from propositional CPs (cf. (54)) is worked out in Barbiers (2000). Propositional CPs are generated as a sister of V, and factive CPs are adjuncts to VP:

[10] Marga Reis (p.c.) points out to me that in German, these are cases of scrambling and thus do not tell us anything about root phenomena.

(54)



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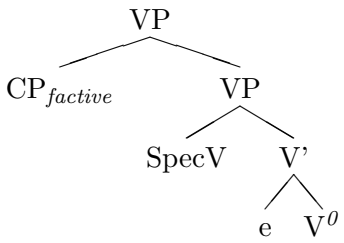


Barbiers considers Dutch, but most of the observations hold for German as well.

It is apparent that if a factive argument clause is an adjunct, it will resist extraction due to its adjunct islandhood. Thus, in his approach, non-transparency follows naturally from the assumption that factive CPs are adjuncts.

Another effect of its opacity can be perceived in constructions which he calls *long answer scrambling*. As illustrated in (56), it is analyzed as a reduction of a finite *that*-clause.

(56) Who do you think has read the book?

Ik denk JAN/HIJ
I think John/he.

(57) *Ik betreur ~~dat~~ PIET ~~directeur~~ ~~wordt~~.
I regret that Pete director becomes.
[= Barbiers (2000), (21a), (23b)]

This is possible only with propositional matrix predicates and not with factive predicates, cf. (57). Barbiers shows that the distribution of *long answer scrambling* correlates with other properties, in particular that every construction that allows for extraction allows for reduction (and vice versa). The remnant in *long answer scrambling* constructions is moved to a position inside the matrix VP. The construction boils down to a combination of long scrambling and reduction of the backgrounded embedded clause at PF:

(58) Ik had [morgen]$_i$ gedacht ~~[$_{CP}$ dat Jan t$_i$ zou komen]~~.
I had tomorrow thought that John would come.
[= Barbiers (2000), (31)]

A refinement is needed here. The unreduced version is not well-formed with subject movement:

(59) *Johannes habe ich gedacht dass das Buch gelesen hat.

There might be a difference between Dutch and German here. For German, I propose that in some *long answer scrambling* constructions the underlying clause is not a *dass*-clause but an embedded verb-second clause. I will analyze it as a simple ellipsis then as in (60)

(60) Ich habe gedacht, Johannes ~~hat das Buch gelesen~~.
I have thought, Johannes has the book read.

Still, I agree with Barbiers (2000) for cases in which there seems to be movement into VP. This is true in cases like (58) (Dutch) and (61) (German). In sentences like (59), the subject cannot be moved into the matrix VP.

(61) Ich habe morgen gedacht, dass er kommt.
I have tomorrow thought that he comes.

The difference between *long answer scrambling* and verb-second complement ellipsis is apparent in examples (62) to (65).

(62) Ich habe gedacht, Johannes. (V2 complement ellipsis)

(63) *Ich habe Johannes gedacht. (Long answer scrambling)

(64) Ich habe gedacht, morgen. (V2 complement ellipsis)

(65) *Ich habe morgen gedacht. (Long answer scrambling)

Topicalization provides more evidence for the argument-adjunct-hypothesis. In Dutch, only maximal projections may undergo topicalization. A propositional CP is analyzed as an argument and thus CP has to move within VP, VP cannot be moved without CP. A factive CP being an adjunct, VP can move and leave CP behind. Barbiers (2000) gives the following examples for Dutch.

(66) Ed zal wel [$_V$ vinden [$_{CP}$ dat Piet de winnaar is]].
Ed will AFF find that Pete the winner is.

(67) *[$_V$ Vinden] zal Ed wel [$_{CP}$ dat Piet de winnaar is].
Find will Edd AFF that Pete the winner is.

(68) Ed zal wel [[$_{VP}$ toegeven] [$_{CP}$ dat Piet de winnaar is]].
Ed will AFF admit that Pete the winner is.

(69) [$_{ZP}$ Toegeven] zal Ed wel [$_{CP}$ dat Piet de winnaar is].
Admit will Ed AFF that Pete the winner is.
[= Barbiers (2000), (33)a-d].

This is not true for German because a propositional CP may well be topicalized without the CP (see also section 4.1).[11]

Convincing data comes from Principle C effects. Principle C forbids pronouns from binding coreferring expressions. Being a sister of V, all constituents in propositional complements are c-commanded by constituents of the VP. A pronoun in the matrix clause cannot be coreferent with a c-commanded NP in the complement clause. A factive complement is an adjunct, so the constituents in the CP are not c-commanded by constituents in the matrix. Therefore, there might be referring expressions in the complement coreferent with pronouns in the matrix.

(70) *Ik vond van'm$_i$ [$_{CP}$ dat Ed$_i$ intelligent was]. (propositional)
I found of him that Ed intelligent was.
[= Barbiers (2000), (35d)]

(71) We verborgen voor'm$_i$ [$_{CP}$ dat Ed$_i$ gekozen was]. (factive)
We hid from him that Ed chosen was.
[= Barbiers (2000), (35b)]

[11] Admittedly, stranding a propositional CP is worse than stranding a factive CP.

(i) ?Finden wird Ed sicher, dass Peter der Gewinner ist. (propositional)

(ii) Zugeben wird Ed sicher, dass Peter der Gewinner ist. (factive)

I have the impression that this has semantic or pragmatic reasons. With *finden*, it seems to be marked. But it is fine in a sentence like (i).

(i) Behaupten tut Karl bestimmt, dass Peter gewinnen wird. Aber ob er das auch glaubt?

Barbiers additionally points out that ambiguous predicates only have a factive interpretation with a topicalized V. The same restriction applies here. The syntactic structure suggests a factive reading but according to my intuition for German, the propositional reading is still accessible.

(i) Peter hat bereits gestern gesagt, dass Paul der Gewinner ist. (factive/propositional)

(ii) Gesagt hat Peter bereits gestern, dass Paul der Gewinner ist. (factive/?propositional)

(iii) Gesagt hat Peter bereits gestern, dass Paul der Gewiner ist. Aber ob er es auch glaubt? (propositional)

Barbiers admits that this is not a clear difference for all speakers. The same goes for the German data. But I agree with Barbiers that the basic observation is correct.[12]

(72) *Wir verdächtigten ihn$_i$, dass Peter$_i$ die Wahl gewonnen hatte. (propositional)

(73) ?Wir verheimlichten ihm$_i$, dass Peter$_i$ die Wahl gewonnen hatte. (factive)

In a grammaticality judgment study, Principle C violations were tested in order to check whether factive complement clauses are more easily understood as adjuncts. In this study, 66 informants were asked to give a grammaticality judgement (ranging from 1 (bad) to 5 (good)) for 16 sentences (plus 14 normed fillers) which were presented in a web-based questionnaire. The items were presented under two conditions. In the first condition, the proper name was part of the matrix clause (as an object) and a personal pronoun in the complement clause. In the second condition, proper name and coreferent pronoun changed places. The informants were instructed to consider the reference conditions given in brackets to guarantee that the coreferential reading was regarded.

(74) factive

a. Lars merkte ihr deutlich an, dass Petra nicht in Eile war.
(sie = Petra)

b. Lars merkte Petra deutlich an, dass sie nicht in Eile war.
(sie = Petra)

(75) attitude

a. Paula wünschte Walter, dass er rausgeschmissen wird.
(er = Walter)

b. Paula wünschte ihm, dass Walter rausgeschmissen wird.
(er = Walter)

[12]Note that the propositional predicate takes adjuncts in the case of V2-complements. In this case, there is no principle C effect:

(i) Wir verdächtigten ihn$_i$, Peter$_i$ habe die Wahl manipuliert.

The items contained factive predicates and attitudes[13]. In table 4.1, I present the average judgments. The crucial value is the difference between

Table 4.1:

	predicate	condition	av. judgement	Δ
factive	*anmerken*	pronoun > proper name	3.14	
		proper name > pronoun	4.69	1.55
	böse sein	pronoun > proper name	2.62	
		proper name > pronoun	4.31	1.69
	gönnen	pronoun > proper name	2.22	
		proper name > pronoun	4.19	1.96
	verheimlichen	pronoun > proper name	2.34	
		proper name > pronoun	4.76	2,41
	vergessen	pronoun > proper name	3.00	
		proper name > pronoun	4.15	1.14
	dankbar sein	pronoun > proper name	2.28	
		proper name > pronoun	4.48	2.21
attitude	*berichten*	pronoun > proper name	2.28	
		proper name > pronoun	4.55	2.28
	beschuldigen	pronoun > proper name	1.89	
		proper name > pronoun	4.37	2.48
	versichern	pronoun > proper name	2.38	
		proper name > pronoun	4.48	2.10
	wünschen	pronoun > proper name	1.96	
		proper name > pronoun	4.52	2.56

the average judgements under both conditions because acceptability may vary from predicate to predicate. The mean difference for the factive predicates is 1.83, whereas for the attitudes it is 2.36. Thus, there is a difference between factive and non-factive predicates with respect to Principle C violations. However, there is variation among the predicates, and it is hard to

[13]In the survey, six ambiguous predicates were tested in order to investigate their class membership. *Vorwerfen* (difference: 1,48), *abnehmen* (difference: 1,81) and *verraten* (difference: 1,85), for example, do not show a strong Principle C violation effect although there are both factive readings and non-factive readings of these predicates. Further research might disambiguate the two readings using subjunctive I forms in opposition to indicative (past) forms.

control factive and non-factive readings for every predicate.[14]

Note that the factive CP has to be an adjunct to a projection below the subject (and higher than PP complements) as the subject c-commands the extended VP including the VP and its adjunct.

(76) *Er$_i$ gab zu, dass Peter$_i$ die Wahl gewonnen hatte.

I mentioned in section 3.4.1 that NPIs in factive complements cannot be licensed by matrix negation (and this has already been noted by Kiparsky & Kiparsky, 1971):

(77) Peter glaubt nicht, dass Anna auch nur einen Finger rühren würde. (propositional)

(78) *Peter bedauert nicht, dass Anna auch nur einen Finger rühren würde. (factive)

An analysis which takes factive complements as adjuncts is compatible with this observation.

However, as the effects are weak, let me assure that my proposal does not hinge on the judgments of these Principle C data but still explains why these examples are grammatical for many speakers.

Let me consider Principle C effects with CPs in the middle field. We can observe in (79) that CPs in the middle field have their base position in VP, in contrast to the adverbial adjunct clause in (80).

(79) *weil er$_i$ [dass Peter$_i$ mich gekränkt hat] nicht bemerkt.

(80) weil er$_i$ [nachdem Peter$_i$ mich besucht hat] wieder nach Hause gefahren ist.

The ungrammaticality of (79) provides evidence that the CP in this example is in its base position, i. e. in VP, and that it is not an adjunct. When the CP is scrambled into a position above the subject as in (81), it seems to be reconstructed in this position as well, otherwise (81) would be ill-formed.

[14] As indicated above, subjunctive I may help disambiguate. Possibly, one may find differences in the judgments for Principle C violations triggering the factive and non-factive reading for the same (ambiguous) predicate. However, subjunctive I may trigger not only attitude but also *verbum dicendi* readings, and I am not sure what the effects are for *verbum dicendi* predicates since they might occur more freely syntactically since the reason for their being more free syntactically might be that the subjunctive I suggests a separate interpretation of the *dass*-clause. This is speculation and has to be left for further research.

(81) weil [dass er$_i$ mich gekränkt hat]$_j$ Peter$_i$ t_j nicht bemerkt.

This means that the locational explanation of Barbiers (2000) is not the general explanation. If there are factive CPs which are not adjuncts, adjuncthood cannot be the triggering factor for factivity. This means, however, that there is no uniform base position for factive complements. I propose instead that their characteristic property is their *not* being m-selected. Hence, I will assume that factive CPs may be generated as sisters of V, but in these cases, they still differ from propositional CPs.

M-selection and non-factivity

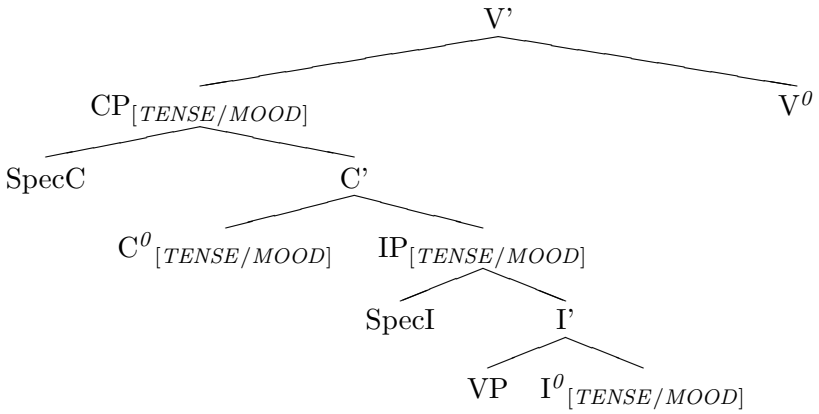
Let me reconsider the definition of a barrier from Müller & Sternefeld (1995). They argued that all CPs are barriers but that non-factive CPs can be made transparent because they are m-selected. Being m-selected, in their approach, is a lexical property which has to be stipulated in order to derive the difference between factive and non-factive CPs. I propose that there is a morphological difference which we have already derived on semantic grounds: the tense and mood variables. Let us assume that (propositional) predicates select for CPs which are marked by the feature [TENSE]. Semantically, they select intensionalized properties of times, and their being unsaturated is mirrored syntactically in this feature.

Now, both factive and propositional complements are tensed, meaning that they have a tense projection (this may be a contrast with bare VP-complements, for instance). But what is the difference between factive and propositional complements with respect to their being tensed? We have seen in section 2.2.2 that the difference is that propositional CPs are tensed superficially but carry zero tense which has to be bound. Intuitively, this is a relevant feature to be projected from I to C because the CP is unsaturated. Let us assume that the feature [TENSE] marks a phrase which seeks external indexing of its temporal variable. The (propositional) matrix predicate, on the other hand, semantically, s-selects a proposition, and it m-selects a CP marked with [TENSE]. This may correlate with complementizer selection (as in Greek, see Giannakidou, 1998). In German the complementizer *dass* may have two homophonous functions, one specified for [TENSE] and one without hosting this feature. I assume this *dass* is underspecified for this feature, thus it receives the feature from the IP if the IP is [TENSE]. C^0 hosts this feature but does not have a semantic contribution itself. The verbal

character of sentential complements is captured by the feature [TENSE]. The other side of the coin is that factive complements are 'more nominal' due to their lack of the feature [TENSE].

Of course, not only tense but also mood is involved in this picture. The more precise label is [TENSE/MOOD].

(82) Subcategorization of propositional CPs



I have argued that influence predicates are the circumstantial counterparts of attitudes. This correlation does not only hold for the semantics but also for the syntax of the predicate classes. The complements of influence predicates are m-selected for the feature [TENSE/MOOD] just like attitudes. If follows that they have to be transparent for extraction as well, which is borne out:

(83) [Diese Dinge]$_i$ befahl er, dass man t$_i$ nehmen und verteilen solle.

(84) Wohin$_i$ hat er dir erlaubt, dass du t$_i$ fährst?

This raises doubts on the correlation between licensing V2 complements and transparency for extraction. While *befehlen* allows V2-complements, *erlauben* does not.

(85) Er befahl ihm, er soll alle Karten wieder einsammeln.

(86) *Er erlaubte ihm, er darf/kann/soll alle Karten mitnehmen.

Thus, I assume that licensing of V2 is independent from extraction facts. Extraction is possible for both attitudes and influence predicates.

If factive CPs are not m-selected, do we have to restrict the c-selectional requirements of factive predicates? I prefer the idea that they are not constrained syntactically but only semantically. For instance, we will have to

exclude *ob*-complements semantically. This is elaborated in D'Avis (2001), p. 100ff.[15]

My claim that factive CPs are not restricted categorically captures the fact that factive predicates subcategorize for nominals much more easily than propositional predicates. We do not find suitable nominal paraphrases for propositional complements:

(87) ?Er glaubt die Aussage/den Glauben/die Annahme/den Gedanken, dass Anna schwanger ist.

(88) ?Er denkt den Gedanken, dass Anna schwanger ist.

(89) Er denkt, dass Anna schwanger ist.

Example (88) is different from (89). Moltmann (2003) calls this the 'objectivation effect'. We do not get these difficulties with factive predicates because the argument position of factive complements is not restricted to CPs.

(90) Peter ärgert sich über das viele Herumstehen.

In English, factive predicates are compatible with gerunds and derived nominals.

(91) They rediscovered having left the group.

(92) We (dis)approve [the invasion of Iraq].

[both examples taken from Ormazabal (2005)]

For these reasons, I will assume that factive predicates may subcategorize for bare CPs (of different flavors, [+wh] or [-wh], or also *wenn*-CPs) and bare NPs. We will see that there is evidence that factive predicates also subcategorize for VPs. I cannot give a positive definition as to what all these phrases have in common. I assume that factives do not c-select their complements but only s-select them.

[15] Maybe it can be shown that in *ob*-complements, tense has to be bound. The ungrammaticality of a simultaneous reading of present tense in (ii) hints in that direction because it seems to need zero tense. With past tense, I only get the backshifted reading which is bound as well. However, I will not consider wh-clauses any further.

(i) Peter wusste, wann Anna nach Hause kam.

(ii) Peter wusste, ob Anna nach Hause ?kam/kommt.

4.2.2 Summary

In this section, I presented syntactic differences between factive and propositional CPs. The transparency of propositional CPs for extraction was explained with reference to Müller & Sternefeld (1995) who assume that only m-selected CPs can be made transparent via incorporation of the functional heads.

Factive CPs differ from propositional CPs. The most important difference is the opacity of factive CPs for extraction. I have presented several approaches which seek to explain the difference between factive and propositional CPs. It was argued that the most convincing approach again deals with m-selection. In contrast to propositional CPs which are m-selected, factive CPs are not and thus are barriers for extraction. M-selection in the approach of Müller & Sternefeld (1995) is a stipulative, lexical property of selecting predicates. I have traced it back to the feature [TENSE] which can be derived from the binding of tense and mood in the complements of propositional complements. Since propositional predicates select for CPs which are unsaturated with respect to tense and mood, they m-select their complements while factive predicates do not. In this way, the syntactic properties of factive and propositional predicates can be related with their semantic behavior in the temporal and modal domain.

4.3 On the category of infinitival complements

As infinitival complements have no overt complementizers in German it is legitimate to ask whether they are CPs at all. In fact, the morphosyntactic form only gives evidence for VP as there is no overt subject and nothing motivates functional projections like tense. However, the syntactic behavior provides evidence for a more complex structure. I have presupposed up to this point that infinitives carry semantic zero tense and mood, thus, so it seems natural to assume that they have syntactic tense and mood projections. This has to be motivated on syntactic grounds now. We will see here that all infinitival complements embedded under intensional predicates are CPs. Since this thesis focuses on German, I will not address English ECM-constructions under intensional predicates like in (93):

(93) Peter believes Mary to be pregnant.

Furthermore, I will focus on infinitival complements embedded under attitudes (and factives). There is another class of predicates which select for infinitival complements, which Karttunen (1971a) labeled 'implicative' predicates. The tests in this section yield different results with implicative predicates. I will briefly address implicative predicates in section 4.5.

Sabel (1996) uses (inter alia) the following distributional tests in order to determine the categorial status of infinitival complements.

Pronominalization *Das* can only be a substitute for CPs (94) and VPs (95), not for IPs (96) or I' (97).

(94) Ich glaube, *dass Hans das Buch verstanden hat*, aber Frank glaubt *das* nicht.

(95) Ich glaube, dass Hans *das Buch verstanden* hat, aber Franz glaubt nicht, dass Hans *das* hat.

(96) *Ich glaube, dass *Hans das Buch verstanden hat*, aber Franz glaubt nicht, dass *das*.

(97) *Ich glaube, dass Hans *das Buch verstanden hat*, aber Franz glaubt nicht, dass Hans das.
[= Sabel (1996), 11b, 14b, 12b, 13b]

This test distinguishes CP/VP from I-projections. Every infinitival complement which allows for resumption with *das* must then either be analyzed as VP or as CP.

(98) Peter glaubt [zu fliegen]$_i$, und Hans glaubt das$_i$ auch.

The *das*-test shows that the infinitival complement does not have an IP status. Sabel suggests that they must be CPs uniformly (except for restructuring infinitives, see section 4.5). The assumption that infinitival complements are CPs is compatible with the results from the pronominalization test.

Scrambling CPs can be scrambled into a position to the left or right of the subject, as in (99) and (100). This holds for control infinitives, too, see (101) and (102). VP-scrambling is ill-formed in German (cf. (103)).

(99) weil [$_{IP}$ [$_{CP}$ dass man den Finanzminister entlassen wird]$_i$ [$_{IP}$ jemand den Journalisten t$_i$ erklärt hat]]

(100) weil jemand $[_{CP}$ dass man den Finanzminister entlassen wird$]_i$ den Journalisten t_i erklärt hat

(101) weil $[_{\alpha}$ den Finanzminister zu entlassen$]_i$ jemand den Journalisten t_i erklärt hat

(102) weil jemand $[_{\alpha}$ den Finanzminister zu entlassen$]_i$ den Journalisten t_i erklärt hat

(103) *weil $[_{VP}$ den Journalisten das erklärt$]_i$ jemand t_i hat.
[= Sabel (1996), 19a, 19b, 20a, 20b]

Coordination Only constituents of the same categorial status can be coordinated.

(104) Hans glaubt $[_{\alpha}$ die richtige Partei zu wählen] und $[_{CP}$ dass sie die Wahl gewinnen wird] [=Sabel (1996), (30b)]

(105) Hans glaubt $[_{CP}$ dass seine Partei gewinnen wird] und $[_{CP}$ mit seiner Stimme große Macht zu haben]

It is reasonable to conclude that infinitival complements of attitudes (and influence predicates) are CPs.

PRO If infinitivals are CPs, they must have a subject. Principle C effects show that there must be a PRO subject in control infinitives. In (106), *Anna* is illicitly c-commanded by *ihr*. In (107), coreference is licit because the complement clause is scrambled into a higher position. PRO is not coreferential with *Anna* since *versprechen* is a subject control verb. With an object control predicate, PRO binds *Anna*, which makes (108) ungrammatical. The difference between (107) and (108) cannot be explained without reference to a PRO in infinitival complements.

(106) *weil der Professor$_i$ ihr$_j$ nicht versprechen konnte $[_{\alpha}$ PRO$_i$ Dr. Frank mit Anna$_j$ bekannt zu machen].

(107) weil $[_{\alpha}$ PRO$_i$ Dr. Frank mit Anna$_j$ bekannt zu machen$]_k$ der Professor$_i$ ihr$_j$ nicht t_k versprechen konnte. [=Sabel (1996), (35'a,b)]

(108) *weil $[_{\alpha}$ PRO$_i$ Dr. Frank mit Anna$_i$ bekannt zu machen$]_k$ der Professor ihr$_i$ nicht t_k erlauben konnte. [=Sabel (1996), (36b)]

Apart from distributional reasons, long *wh*-movement out of infinitivals may also provide an argument in favor of a CP-analysis:

(109) Wen$_i$ befürchtet Maria [$_{CP}$ t_i zu kennen]?

The intermediate landing site for cyclic wh-movement is SpecC of the embedded CP.

In this section, the standard assumption of the categorial status of (propositional) infinitival complements was justified. There are good reasons to assume, despite their lack of an overt complementizer, that they are CPs. The advantage for subcategorization theories is that predicates uniformly select for sentential arguments no matter whether infinitival or finite. We will see in the next section that there are certain non-propositional infinitival complements which may be less complex than propositional CPs.

4.4 Non-structural θ-role assignment

I assumed in line with Büring & Hartmann (1995) that proposition arguments are assigned their θ-role in VP and then escape from VP and are moved to the post-verbal field leaving a trace in VP. This is structural θ-role assignment which does not differ from θ-role assignment to nominal phrases. V^0 selects for a constituent marked with the feature [TENSE], and propositional CPs (finite or infinitival) carry this feature.

Factive and propositional CPs Webenhuth (1992, p. 106) notices that there are two classes of predicates. Class 1 predicates allow their complement clause to be distributed in the middle field, see (110), while class 2 predicates do not, not even marginally like in (111):

(110) weil ich dass Maria schwanger ist nicht glaube. (class 1)

(111) *weil ich dass Maria schwanger ist mich nicht freue. (class 2)

Webelhuth (1992) notices furthermore that only class 1 predicates allow their complement clause to be topicalized and only class 1 predicates select DP complements.

(112) Dass Maria schwanger ist glaube ich nicht.

(113) ??Dass Maria schwanger ist, freue ich mich nicht.

(114) Diesen Unsinn glaube ich nicht.

(115) *Diesen Unsinn freue ich mich nicht.

In Table 4.2, we can see the properties of both groups as stated correctly by Webelhuth.

Table 4.2:

Verb	prefield	middle field	extraposed
class 1 predicates			
bedauern	+	+	+
bemerken	+	+	+
anmerken	+	+	+
mitteilen	+	+	+
class 2 predicates			
sich schämen	?	?	+
dankbar sein	?	?	+
sich ärgern	?	?	+
sich freuen	?	?	+
sich wundern	?	?	+
hinweisen auf	?	?	+

Usually, *sich freuen* selects for *über*-PP-arguments. Whenever its selectional requirements are met, topicalization and a preverbal position for DPs are possible:

(116) Über diesen Unsinn freue ich mich nicht.

(117) Darüber, dass Maria schwanger ist freue ich mich nicht.

There are two questions which are raised by these observations. Firstly, why is it that class 2 predicates do not allow their complements to appear in SpecC or in the middle field? Second, why do they allow 'bare' CP complements in extraposed position?

Let us assume that the first group consists of 'normal' predicates which assign their theta-role to their complement structurally, i. e. they receive abstract case in the canonical argument position. 'Structurally' means that the c-selectional requirements are met, or in other words that the argument clause fills the position where a nominal argument is assigned structural or inherent case.

What about class 2 predicates? Both their distributional restrictions and the fact that they do not meet the c-selection requirements suggest that

they do not originate in a position as a sister of V.

Simple ellipsis approaches (ellipsis of the PP-correlate) do not explain the distributional differences between the two groups. If the PP argument were elliptic, they should all be fine in topicalized position. There is a more elaborate explanation referring to PP-deletion in Sternefeld (2006, p. 350ff). He argues that class 2 predicates select for an optional PP-shell which may be deleted when the argument is located in VP. It cannot be topicalized without the PP-shell because the PP is an island for topicalization for CP. Neither can it be topicalized together with the PP-shell because the invisible lexical head disqualifies the PP-CP for movement. The problem is that it does not depend on PP-selection since there are predicates selecting for inherent case which belong to class 2 predicates as well.

(118) *Dass er Tiere quält, bezichtige ich ihn.

Genitive object clauses are marked in the prefield.

(119) ?Dass du das schon weißt, bin ich mir bewusst.

Recht haben in (120a) usually subcategorizes for a *mit*-PP. Example (120b) shows that Principle C is not violated — evidence for the conclusion that the *dass*-clause is an adjunct.

(120) a. ??Sie hat recht, dass Peter sicher zu spät kommt.

b. ?Er gibt ihr$_i$ recht, dass Anna$_i$ sicher genommen wird.

For these reasons, I assume that the distinction between class 1 and class 2 predicates is between structural and inherent case. I assume that *dass*-clauses in sentences with class 2 predicates do not originate in VP and thus do not have to meet the c-selectional requirements (PP-selection, inherent case). Thus, we need a different notion of θ-role assignment. How can the θ-role be assigned in a different way than via government of V^0?

V2-complements V2-complements provide evidence of non-structural θ-role assignment. As Reis (1997) and Frank (2000) note, complement V2-clauses do not behave like *dass*-clauses. V2-clauses occur as complements inter alia to *verba dicendi* and *verba sentiendi*, cf. (121) and (122).

(121) Er sagte, sie habe recht.

(122) Er fühlte, er liebt sie.

Reis (1997) shows that V2-clauses do not occur in topicalized or intraposed position, do not allow correlates, do not allow extraction and cannot be coordinated with *dass*-complements.

V2-clauses are substitutes for *dass*-clauses but not in a one-to-one relation since not all *dass*-clauses can be turned into a V2-clause. Therefore, V2-clauses are not genuine complement clauses, not 'primäre Selektionsobjekte' (Frank, 2000). Frank (2000) observes that V2-clauses are restricted in several ways:

– V2-clauses occur only in extraposed position. They cannot be topicalized:

(123) Jede von ihnen dachte, sie sei krank.

(124) Sie sei krank dachte jede von ihnen.

– V2-clauses and *dass*-clauses cannot be coordinated.

(125) *Ich glaube, du bist doof und dass ich dich nicht mag.

– V2-clauses under *verba dicendi* and *sentiendi* do not allow correlates:

(126) Er glaubte (*es), sie hat recht.

Based on Reis (1997), Frank (2000) argues that syntactically, V2-clauses are not in argument position but are rather adjuncts to VP. According to the Uniformity of theta-role Assignment UTAH (Baker, 1988), identical thematic relations have to be represented in a structurally identical way. If V2-clauses receive the theta-role which normally is assigned to an argument, this is in conflict with UTAH because the same theta role is assigned via different structures. Frank (2000) concludes that not every case of c-selection comes from heads and that V2-clauses are licensed in a position higher than 'proper' arguments.

We have to abandon the assumption of the UTAH and allow non-structural θ-role assignment, i. e. a possibility for one and the same θ-role to be assigned via two different structures. I propose just like Frank (2000) and Reis (1997) that there is no c-selection in the case of V2-complements but only s-selection. The semantic type has to 'fit' the s-selectional requirements of the control predicate. (I will not go into the details here of how the s-selectional requirements of predicates s-selecting V2 complements may be defined.)

Now, we can use this mechanism for non-structural propositional and factive CP complements as well. With non-structural θ-role assignment, the clause is not structural argument and not c-selected, instead, it is base-generated and adjoined to I'. In the matrix VP, the argument position remains empty. This opens the opportunity to assign the remaining θ-role non-structurally. The CP will then be assigned the non-discharged θ-role.

This idea finds support in a proposal by Bayer (1997). His proposal in fact concerns also the extraction of propositional CPs. He refers to Hoekstra (1987) who observes that traces serve only to satisfy the Projection Principle on all levels of representation. I will not go into the question of whether his analysis would be better for propositional complements. Consider the structure in (127):

(127) $[_{XP}\ [_{XP}\ \mathrm{e}_i\ \mathrm{X}]\ \mathrm{YP}_i]$ [= Bayer (1997), (27)]

YP is extraposed from its base position and adjoined. If we delete the trace, the Projection Principle is violated, the verb cannot discharge its θ-role and YP is unlicensed. But crucially, YP remains in the domain of X. Bayer now proposes that since X cannot project to X' and XP, it 'looks' one projection higher. This opens the way for X to now license YP on its right-hand side. He calls this mechanism *argument shift* since the YP moves to a position which allows it to bear a direct object relation to the V. Bayer (1997) (cf. also Bayer, 1995) overcomes the reservation that I^0 is between the V and the adjunction position by reference to V-to-I-raising due to incorporation. In this way, an adjoined CP (no matter whether it leaves a trace which is deleted) may become the direct object on the right of V. The mechanism is appealing — in the basic intuition it states that it is the undischarged θ-role in the base position which allows V to 'look' into higher projections. Apart from the fact that it is an adjunction position (and not below V), this approach has similarities to Haider (1995). There is a structural argument position above VP where sentential arguments which do not originate in the canonical argument position for nominal arguments can be generated. For this reason, I will call this adjunct-complements 'bare' complementation because it involves θ-role assignment not via c-selection but via its structural position.

Additionally, there is non-structural θ-role assignment for infinitival clauses as well.

(128) Peter freute sich, Maria mal wieder gesehen zu haben.

(129) Peter freute sich darüber, Maria mal wieder gesehen zu haben.

(130) *Maria mal wieder gesehen zu haben, freute Peter sich.

(131) Darüber, Maria mal wieder gesehen zu haben, freute Peter sich.

Example (128) is a case of non-structural θ-role assignment. This is analogous with finite clauses. The c-selectional requirement of *sich freuen* is for a PP which is not met in (128) but only in (129). As non-structural θ-role assignment is possible only in extraposed positions, the infinitival clause is ungrammatical in the prefield when occurring without a PP-correlate (cf. (130) vs. (131)). I conclude that infinitival clauses have the same structure as finite complements with regard to their θ-role assignment.

Default semantics for supernumerary *dass*-clauses What if there is no θ-role left in the grid to be assigned non-structurally? Just as DPs or PPs can bear temporal or modal thematic relations, I propose that there are default thematic relations for sentential expressions. I rely on the sentence connection theory of Wöllstein (2008). She proposes that there are default relations between non-complement clauses and their matrix clauses. With her 'semantic dependence relation' structures lacking connectors can also be interpreted. The interpretation of the subordinate clause is based on causality. The connection behind may be that if two situations are syntactically related, they are supposed to be related semantically as well. There are two types of causal relationships: first there is the default relation of cause and effect (in a Lewis-style causality where cause is a necessary condition). Secondly, there is a reverse relation where the cause is a sufficient condition. Wöllstein argues that whenever two connects are not of similar type, the semantic relation is interpreted along the line of those two causal relations.

In brief, there are purpose and causal relationships (Wöllstein, 2008). I will not be concerned here with which semantic factors trigger the default or the reverse causal relation.[16] Free *dass*-clauses cannot be mapped on a

[16]My impression is that for a state in the matrix, the general strategy is to assume that the additional role is something like cause. If the matrix expresses an action, we will generally assume that it is a purpose. The paraphrase for non-argument role relations under states is 'given the fact that...':

(i) Er freut sich, dass er dich heiratet.
Given the fact that he marries you, he is happy.

θ-role which is not filled structurally already — simply because there is none left. Depending on the matrix situation type, the subordinated proposition or fact is given a causal interpretation or embedded under a default operator CAUSE.

(i) Was tun Sie denn, dass er so schreit?

(ii) Was tun Sie denn, dass sie gesund werden?

I would like to propose that for semantic reasons, this is more likely with factive predicates. There are *dass*-clauses which receive a default non-argument interpretation which semantically fits the thematic role of a factive complement for emotives, a stimulus. I suspect that factive complements may be re-analyzed as causal adverbial clauses and thus be generated as adjuncts.

(132) Ich bin ihm$_i$ böse, dass Peter$_i$ immer zu spät kommt.

(133) Ich bin ihr$_i$ dankbar, dass Anna$_i$ immer rechtzeitig kommt.

Example (134) can be paraphrased either by (135) or by (136) since due to the lexical semantics of the matrix predicate, the theme argument is conceptually very close to a causal adverbial clause. Hence, what looks like an argument clause (with an ellipsis), is actually a non-argument clause which receives its semantic relationship via general mechanisms.

(134) Peter ist stinksauer, dass du ihn nicht angerufen hast.

(135) Peter ist stinksauer darüber, dass du ihn nicht angerufen hast.

(136) Peter ist stinksauer, weil du ihn nicht angerufen hast.

It is independent from c-selection:

(137) Ich bin ihm böse, dass er sie geschlagen hat.

Jm. böse sein 'be angry' does not c-select for a PP-complement:

Under a matrix clause which expresses an action, there is a covert operator, CAUSE, which binds mood in the subordinate clause.

(i) Sie heiratet ihn, dass er sich freut.
Sie heiratet ihn CAUSE dass er sich freut.

Dass-clauses subordinated under state-expressing matrix clauses tend to be factive, whereas those subordinated under action-expressing matrix clauses are irrealis.

(138) Ich bin ihm böse *darüber/??dafür/*damit, dass er sie geschlagen hat.

Maybe it does not even s-select a theme-argument at all. The mechanism at work is even more abstract, and it by-passes the selectional requirements of the matrix predicate. In this way, free *dass*-clauses and factive complements of class 2 predicates overlap, and this may be the reason for the weaker Principle C violation effects with factive complements in general.[17]

There are semantic restrictions for 'bare' structural complementation. Facts can easily be conceptualized as causes/stimuli and thus be interpreted as the theme argument of an emotive factive. Propositional CPs can be bare structural complements as well but they are harder to define semantically. I have the impression that subjunctive I makes bare structural complements better for propositional complements — maybe because subjunctive I draws the proposition nearer to implicit assertions (see also V2-complements) which can more easily be resolved as arguments[18]:

(139) Sie einigten sich darauf, dass Peter der bessere Kandidat ist.

(140) Sie einigten sich, dass Peter der bessere Kandidat ?ist/sei.

4.5 Excursus: Implicative complements

Focusing attitudes and factive predicates, many of the observations made for these predicates do not carry over to the class of implicative predicates. Since there are predicates which are structurally ambiguous between factives and implicative predicates, I will touch on implicative predicates briefly at this point. Although this is sketchy, it will highlight important differences between factives, intensional predicates and implicatives.

[17] Note that if all factive complements can be analyzed as adjuncts marginally, then they are instances of integrated non-structural complements — in contrast to V2 which is unintegrated according to Reis (1997).

[18] Furthermore, according to my intuition, subjunctive I in a propositional complement weakens Principle C violations:

(i) *Man erwiderte ihm$_i$, dass Peter$_i$ angenommen ist.

(ii) ?Man erwiderte ihm$_i$, dass Peter$_i$ angenommen sei.

Since bare structural complements are adjuncts, this suggests that subjunctive I complements are more likely to be adjoined.

The label 'implicative' comes from Karttunen (1971a) who described this predicate class. The characteristic property of implicatives is that the truth of their complement depends directly on the truth of the matrix clause:

(141) Anna schafft es einen Baumkuchen zu backen.
→ Anna backt einen Baumkuchen

(142) Anna schafft es *nicht* einen Baumkuchen zu backen.
→ Anna backt *keinen* Baumkuchen

There are negative implicative predicates as well:

(143) Anna scheitert daran, einen Baumkuchen zu backen.
→ Anna backt *keinen* Baumkuchen

(144) Anna scheitert *nicht* daran, einen Baumkuchen zu backen.
→ Anna backt einen Baumkuchen.

The implicational properties are summarized in Table 4.3: Examples of im-

Table 4.3: Truth value of the complement clause

	affirmative matrix	negated matrix
implicative	+	–
negative implicative	–	+

plicative predicates are listed here (examples taken from Karttunen, 1971a, with their German counterparts added)

(145) Positive implicatives: *manage, remember, bother, get, dare, venture, condescend, happen*
es schaffen, daran denken, sich die Mühe machen, dazu kriegen, wagen, sich herablassen
furthermore: *fertigbringen, gelingen, sich unterstehen*

(146) Negative implicatives: *forget, fail, neglect, decline, avoid, refrain*
vergessen, scheitern, unterlassen, nachlassen, vermeiden, es unterlassen
furthermore *versäumen, sich weigern*

As for complementation, implicative predicates differ from attitudes and factives in that implicative predicates select almost exclusively for infinitival complements:

(147) Peter traut sich, einen Handstand zu machen.

(148) *Peter traut sich, dass er einen Handstand macht.

I assume that implicative predicates differ crucially from attitudes and factive predicates both in their syntax and their semantics. This cannot be covered fully in this thesis. As for their semantics, I assume that with implicative predicates the matrix and the embedded event fuse to denote one single event (or that the matrix predicate merely modifies the embedded event, similar to light verbs). This stipulation can be supported by the observation that the *dare*-event and the *handstand*-event in (147) have to be simultaneous and that in a way, the *dare*-event *is* the *handstand*-event. It is impossible to separate the embedded event temporally, cf. (149) and (150), or modally from the matrix event, cf. (151).

(149) #Peter wagte es gestern, heute zu spät zu kommen.

(150) #Peter versuchte gestern, heute ihren Fehler wiedergutzumachen.

(151) #Peter gelang es, vielleicht ein Geschenk zu kaufen.

Implicative complements may not be modified with respect to aspect:

(152) *Peter gelang es, das Auto repariert zu haben.

(153) *Peter versuchte, sie getroffen zu haben.

Karttunen addresses the temporal properties of implicative predicates. He remarks that 'there is a curious restriction that the main sentence containing an implicative predicate and the complement sentence necessarily agree in tense. Since infinitives contain no overt tense markers, this cannot be observed directly.' (Karttunen, 1971a, p.346.) I suggest that the tense variable in implicative complements is anaphoric to the matrix tense. This follows from the fact that semantically, two events can only form a sum if they overlap (or are indentified with) each other:

(154) Peter wagte es, zu spät zu kommen.

(155) $(\exists e)(\exists t{<}s^*)[t{\subseteq}\ \tau(e)$ & wagen(Peter,e) & zu spät kommen(Peter,e)]

As mentioned by Karttunen, this cannot be shown for infinitival complements. But marginally, some implicative predicates take finite complements, for instance *es schaffen*. In these cases, we get overt tense markers. If it is correct that tense is anaphoric in implicative complements, for German we would expect past under matrix past tense. This is borne out:

(156) Peter schaffte es, dass er zu spät kam.

In a brief COSMAS study of 137 hits for *'schaffte es dass'*[19], 127 carry past tense in the embedded clause. These are some examples:

(157) das Nockalm-Quintett schaffte es, dass auf der Wiese weiter getanzt, gar getobt wurde (COSMAS A97/JUL.14526)

(158) "'Hambach schaffte es nie, dass sich unser Torwart Wetzel einmal strecken musste"' (COSMAS M02/OKT.76553)

(159) Er diskutierte heiß mit ihr und er schaffte es später, dass sie ihre Stimme der SPD gab ... (COSMAS M06/APR.26068)

Note that in (158) the matrix clause is negated, and that negation has scope over the complement clause as well. As we have seen, this is different in factive complements. Correspondingly, NPIs are also licensed in finite complements under implicative predicates.

(160) Peter schafft es nicht, dass er auch nur einen Finger rührt.

From this brief description, it becomes clear that implicative predicates have to be treated separately from attitudes and factive predicates.

As for their syntax, implicative predicates are often restructuring predicates (Wurmbrand, 2001) and there is evidence (i. e. ellipsis data: **Peter glaubt reich zu werden und Paul versucht das auch.*) that they can be smaller than CPs in their category. Furthermore, there does not seem to be a clear argument role of the infinitival complements.

Typically, the infinitival complement seems to be a substitute for of a direct (nominal) object:

(161) Peter wagt/schafft einen Handstand.

But for some implicative predicates, we do not find corresponding nominal or prepositional objects:

(162) *Peter erdreistet sich das Hereinkommen/des Hereinkommens.

(163) *Peter erdreistet sich über/unter/an/bei/von ein Hereinkommen.

In Zifonun et al. (1997), these complements lacking a case-marked nominal counterpart, are called *Verbativkomplemente*. The general observation is

[19]Search request: schaffte es /+w2 dass; corpus: W - Archiv der geschriebenen Sprache, subcorpus: W-öffentlich - alle öffentlichen Korpora des Archivs W.

that only non-reflexive implicative predicates may select for nominal arguments but not all do (see. (164) vs. (165)). Does the infinitival complement bear the argument role of the direct object?

(164) a. Peter vernachlässigt die Arbeit.

b. Peter riskiert einen Blick.

c. Peter schafft den Test.

d. Peter gibt das Projekt auf.

(165) a. ?Peter unterlässt eine Entschuldigung.

b. *Peter zögert einen Besuch.

c. ?Peter traut sich einen Handstand.

d. ?Peter weigert sich eine Entschuldigung.

There are some counter-arguments for the structural analogy of nominal objects and implicative complements. First, passivization as in (167) is unexpectedly bad.

(166) Peter wagt (es), einen Handstand zu machen.

(167) ?Einen Handstand zu machen wird von Peter gewagt.

Second, Robert Van Valin points out to me (p.c.) that infinitival complements in English do not allow clefting (cf. (168) vs. (169)) — in contrast to their nominal counterparts in (170) and (171) which do allow clefting. I suspect that it is the lack of case which is responsible for this.

(168) Peter tried to make a salto.

(169) *It was to make a salto that Peter tried.

(170) Peter tried a salto.

(171) It was a salto that Peter tried.

For these reasons, implicative complements have to be accounted for differently. For my purposes it suffices to state that implicative complements differ both in their syntax and in their semantics from attitudes and factives and that they seem to involve an event-denotation. Much more could be said about implicative infinitival complements which I have to leave for future research at this point.

4.6 Summary

In the previous sections, I have shown that we need a new notion of non-structural θ-role assignment for some complement clauses. Certain predicates selecting inherent and prepositional case can take 'bare' CPs which do not meet the c-selectional requirements of their matrix predicates. This correlates with distributional restrictions: 'bare' CPs under these (class 2) predicates cannot be topicalized and cannot be located in the middle field. I have argued that these complements are 'recognized' via non-structural θ-role assignment, i. e. they are adjoined and mapped onto the undischarged θ-role of the embedding predicate. I have argued with Bayer (1997) that this can also be analyzed as right-hand structural θ-role assignment which I labelled 'bare' structural complementation.

Futhermore, I have shown that bare structural complements are closely related to non-argument clauses, which according to Wöllstein (2008) receive a default semantic role. Since this cause relation is semantically close to the theme arguments of emotive predicates, it was argued that the slightly higher acceptance of adjoined CPs for factive predicates has its source in the reanalysis of a non-argument clause.

Part III

Abstract predicate classes and class shifting

Chapter 5

Class shifting

The aim of this thesis is to find a compositional treatment of complementation and to predict in which environments finite and infinitival complements are distributed.

I adressed two predicate classes:

- Propositional predicates provide lexical binders for the time and world variable of their complements, which in turn need to be unsaturated with respect to tense and mood (except for temporal *de re*). Correspondingly, propositional predicates m-select their complement, a fact which is responsible for their syntactic properties, e. g. their non-transparency for extraction.

- Factive predicates do not provide lexical binders for time and mood in their complement. Their complements are saturated with respect to tense and mood. Complements of factive predicates are eventive. Usually, they denote definite situations which correspond to facts and which are moved at LF to a position heading the speech act domain. For this reason, they are non-asserted and receive a presupposed interpretation. Factive predicates are not necessarily c-selected. Since a factive CP is not marked with the feature [TENSE] (m-selected), it cannot become transparent for extraction.

While I claim the existence of two predicate classes with well-defined and compositionally supported semantic and syntactic features, I do not claim that every predicate is a member of either the one or the other. There are other predicate classes (like implicatives) and most importantly, one particular predicate may be a member of both classes addressed here. Lexical

meaning has too many facets which arise in different utterance situations and secondly, meaning may change depending on the syntactic environment.

I assume that there are default relations between a predicate and the preferred semantic and syntactic setting. These default relationships may be stronger with one and weaker with other predicates. What I am assuming is that there is a 'core meaning' for every predicate. Maybe there are some prominent atomic meaning components. But semantic compositionality is rich and flexible — and it is this flexibility which I would like to shed some light on. I assume that there are abstract predicate classes which are associated with a particular semantics and syntax.

Finite clauses may have indexical tense and mood and thus qualify for a factive interpretation. But tense and mood may also be zero and thus *dass*-clauses occur as arguments of propositional predicates as well. For this reason, finite clauses are possible under most predicates. Infinitival complements carry zero tense and mood. For this reason, they are acceptable under propositional predicates (and under implicative predicates). With cognitive factives, they are highly marked. For emotive predicates, we need a repair-mechanism which reanalyzes the emotive predicate as an attitude, or we have to bind the event variable existentially. This points to an effect which I would like to strengthen in this chapter. What happens if the complement does not entirely meet the requirements? Can we enforce a propositional or a factive reading? Are there predicate classes which are semantically compatible with more than one complement type?

For testing, what we have to do is 'suppress' the default or core meaning of the complement. If we disallow a bound reading of a propositional predicate semantically, will we be able to turn it into a factive complement? And, most interestingly — will this complement have all the semantic and syntactic properties of 'normal' factive complements? If this is possible, meaning shifts support the claims I made for the predicate classes and tell us a lot about the meaning facets of predicates. Uses which seemed to require different lexical entries of a predicate may be reduced to the particular combination of a core meaning, the semantics of complement and the way we connect them. Up to this point, the thesis aimed at establishing the differences between the predicate classes and establishing tests for the different predicate classes: semantic 'suppression' of the propositional

reading, transparency for intensional readings, wh-CPs for factive readings, present-under-past as zero tense and *derived de se* readings which determine an intensional reading of a complement. Chapter 5 shows that one and the same predicate can — in an appropriate environment — have factive, intensional and implicative readings.

5.1 Predicates go factive

5.1.1 Factive *believe*

I have argued throughout this thesis that mood and tense play a crucial role for selection. For intensional predicates, I argued that mood always has to be bound under the predicate. However, this is not always true. There are readings of factive *believe* like in (1) and there are factive readings under influence predicates, see (2).

(1) Ich kann nicht glauben, dass du das gemacht hast. (factive *believe*)

(2) Er hat sie dazu gezwungen, dass sie das gemacht hat. (factive influence predicate)

The aim in this section is to show how we can account for this effect and to see whether it correlates with syntactic effects.

Under attitudes, mood and tense has to be interpreted as bound (including relational mood and tense). Are there also unbound readings (where the complement is not an emulated 'belief content')? That is, can an there be factive readings under *glauben*? There are cases in which the complement of *glauben* can be interpreted as presupposed.[1]

(3) Ich kann nicht glauben, dass du das gemacht hast.

In sentences like (3), the complement has a factive reading under special conditions. Let us examine what the crucial triggers of this effect are. As a testing ground, I would like to use wh-complements. Factives usually allow a wh-complement while propositional predicates do not:

(4) *Peter glaubt, wen sie getroffen hat.

[1] I will not be concerned with the non-presupposed reading which is available as well and more salient in (i):

(i) Ich kann nicht glauben, dass Maria Jungfrau war.

(5) Peter ahnt, wen sie getroffen hat.

In contrast to (4), *nicht glauben können* is possible with a wh-complement:

(6) Ich kann nicht glauben, wen du eingeladen hast.

This factive shift may be due to either semantic or pragmatic reasons. Both possibilities are compatible with my approach. The crucial point is that indexical tense/mood correlate with the ±factive reading. There are several constraints on this factive shift.

First, *denken*, for example, resists this shift, despite all possible supporting factors (focus, *kann nicht*, perfect tense in the embedded clause). *Denken* shares this property with *meinen* and *finden* (examples owing to M. Reis).

(7) Ich kann mir nicht DENKen, dass du gekommen bist. (*factive)

(8) Ich kann nicht FINden/MEInen, dass du gekommen bist. (*factive)

Tense under factive *believe* is interpreted indexically. Example (9) clearly has a double access reading in the presupposed reading.

(9) Ich konnte nicht glauben, dass du gewinnst.

Furthermore, epistemic modals are not redundant under factive *believe* (recall that there is always a propositional reading, and on this reading, the modal can be redundant).

(10) Ich konnte nicht glauben, dass er gewinnen muss.

Typically, *nicht glauben können* on a propositional reading occurs with *sollen* in the complement.

(11) Sie können nicht glauben, dass Jesus Gottes Sohn sein soll. [COSMAS I00/AUG.49467]

(12) "'Die Anleger warten ab"', sagt ein Händler, "'denn sie können es nicht glauben, dass die Jahrhunderthausse vorbei sein soll."' [COSMAS E98/AUG.21393]

(13) Ich kann es kaum glauben, dass Studiengebühren eingeführt werden sollen. [COSMAS V00/SEP.46685]

These examples hint at the explanation I would like to develop here. Evidential *sollen* indicates that it comes from external reasoning that the proposition holds. If the holder excludes that it is not compatible with his personal

dispositions to believe that p, how could the world variable be interpreted modally *de se*? The doxastic alternatives have to be anchored with respect to someone other than but the holder. For this reason, a *de re* reading arises.

For the non-factive reading of *nicht glauben können*, I propose it depends on the scope of the negation:

(14) It is compatible with my dispositions to not believe that p. (propositional)

(15) It is not compatible with my dispositions to believe that p. (factive)

Present-under-past seems to prefer the propositional reading. But past-under-past sentences are ambiguous since past-under-past may be interpreted *de re*.

(16) Petra konnte nicht glauben, dass Anna einen Job hat.

(17) Petra konnte nicht glauben, dass Anna einen Job hatte.

The environments for factive *believe* are often contexts where the subject has clear (perceptual) evidence for a fact but wants to express that due to his dispositions, he is not able to integrate this perception into his beliefs:

(18) Ich konnte nicht glauben, was ich da eben gehört hatte.

(19) Er drehte sich um und ich konnte nicht glauben, dass das Jakob war!

Apart from *glauben*, *erwarten* behaves similarily:

(20) Ich konnte nicht erwarten, was passiert ist.

(21) Ich konnte nicht erwarten, dass du kommst.

I am not able to give an explanation for why some predicates allow this factive shift and some do not. Intuitively, *denken* is too subjective since 'thinkable' entities are purely propositional, while 'believable' entities may have external sources.

There are other lexical and morphological triggers for factive readings.

(22) Wer hätte gedacht, dass Schalke sich to leicht schlagen lässt?

No matter whether this is a semantic or a pragmatic phenomenon, for our purposes it is relevant that tense under factive *believe* is in accordance with tense under 'genuine' factive predicates.

On my compositional approach, it is predicted that if extraction is only possible from propositional CPs, the factive *believe* reading should vanish when we have an extraction context. This is borne out:

(23) Peter kann nicht glauben, dass du nach Brasilien auswanderst.
(±factive)

(24) [Wohin]$_i$ kann Peter nicht glauben, dass du t_i auswanderst?
(*factive)

The opacity effect arises with factive *believe* as well.

(25) [In Italien] glaube ich, dass sie t_i studiert.
(propositional *believe*)

(26) ?[In Italien]$_i$ kann ich nicht glauben, dass sie t_i studiert hat.
(factive *believe*)

NPIs are licensed by matrix negation only in case of non-factive *believe*:

(27) *Ich konnte nicht glauben, dass ihn das sonderlich interessiert hat.

(28) Ich glaubte nicht, dass ihn das sonderlich interessiert hat.

Note that with an infinitive, an indexical interpretation of mood in the complement is unexpected. Indeed, the infinitive is odd under dispositional *nicht glauben können*.

(29) ?Ich kann nicht glauben, so ein Glück zu haben.

A more striking effect is the wh-selection of factive predicates. As mentioned above, factives in contrast to attitudes may embed wh-clauses:

(30) Ich bemerkte später, wen ich geheiratet hatte.

(31) *Ich glaubte später, wen ich geheiratet hatte.

When we take the factive-like *nicht glauben können*, wh-complements are possible:

(32) Später konnte ich nicht glauben, wen ich mir da ausgeguckt hatte.

This means that *nicht glauben können* syntactically behaves like a factive, cognitive predicate. This is not a meaning facet, but actually class shifting.

In sum, factive *glauben* and factive *erwarten* share all relevant syntactic and semantic properties of factive predicates. This indicates that the compositional semantic properties of *nicht glauben können* turn *glauben* into a proper factive predicate, including the syntactic behavior. This, in turn, means that it is the semantics which decides on the class membership of a predicate. M-selection follows s-selection.

5.1.2 Factive influence predicates

Factive circumstantial and deontic influence predicates My hypotheses predict that all *dass*-clauses are ambiguous between propositions and facts. Is this the case for complements of influence predicates? Are there readings in which the finite complement is presupposed? This is hard to imagine as there is a causation relation between the influence and the (modally) resulting proposition. It seems to be impossible to assert an action which presupposes its effect. The only way to interpret this would be to get a reading in which the effect is presupposed and the influence is in question. However, these readings really exist:

(33) Er hat ihr ermöglicht, dass sie ihr Auto verkauft hat.

The factive reading, I admit, is unusal. But I claim that it is an interpretable product of the combination of an influence predicate and a fact-denoting complement. Under which conditions do these readings occur?

I have shown that the complement of influence predicates needs to be zero mood/tense. We have seen that in German, there are many overt forms which may have a semantically underlying zero mood. An infinitival or a zero finite form (which needs to look like a weak form, i. e. indicative) can be zero, or an inherited feature may be evidence for a zero form. In analogy, zero tense in German is either an infinitival, or a finite zero form (which needs to look like a weak form, i. e. present) or carry a feature inherited from the matrix. Finite forms are ambiguous between a zero and an indexical mood/tense. This makes the puzzle very complicated. The claim is, though, that all combinations really do have the presumed readings.

Infinitival complements are the most simple cases, as they can only be zero forms. Hence, there is no ambiguity. Since I am interested in factive complements, let us have a look at finite complements only. A zero finite is the typical finite complement under influence predicates:

(34) Er ermöglicht ihr, dass sie hinfährt. (zero mood/tense; non-factive)

On this reading, mood and tense in the complement are bound by the matrix, and the complement is not presupposed. If we interpret 'hinfährt' as indexical indicative/present, then it is presupposed, and this reading really exists. We can make the reading more prominent with suitable adverbials.

(35) Er ermöglicht ihr (ja erst), dass sie (immer so) erfolgreich ist.
(indexical mood/tense; factive)

This is the intended reading: the complement is presupposed, and the assertion is concerned with the cause for this effect. It is the 'previous event' reading where the speaker wants to tell how and by whom this fact is caused.

Compositionally, we would expect that the factive reading arises whenever the finite form cannot be zero, i. e. whenever is it not realized by morpholgical indicative/present. This is indeed true, but there is another complication. Conceptually, we expect the causing event to be simultaneous with the caused event. Hence, if we get the same morphological tense, we would get two readings: if the embedded tense is interpreted indexically, we get the intended factive reading. But if the embedded tense is inherited from the matrix, again, we get a zero tense/mood reading which will not be a factive reading. These two readings come up in sentences like (36).

(36) Er ermöglichte ihr, dass sie das Auto verkaufte. (zero/indexical)

A good candidate for a non-zero reading are sentences with perfect. Perfect 'tense' is not a proper tense but often analyzed as aspect. For my claim, it is sufficient to assume that it 'breaks' the feature agreement relationship because an anterior relationship is disallowed by the control predicate, and we get a factive reading:

(37) Er hat ihr ermöglicht, dass sie das Auto verkauft hat. (*zero/indexical → factive)

In (37), there is no bound reading, and therefore only the factive reading is accessible. The same holds for sentences like (38), where again, mood in the complement cannot be interpreted as a zero form because it is neither a morphological present (which can be featureless at LF) form nor a case of morphological feature-inheritance.

(38) Er hat ihr ermöglicht, dass sie berühmt werden wird.

It is crucial for my claim to see that this is *not* a matter of temporal relations but a matter of indexical vs. bound mood/tense. Note that even if the infinitival complement is anterior, we do *not* get a factive reading. Instead, the sentence is ungrammatical because there is no bound reading where the caused event is anterior:

(39) *Er hat ihr befohlen, das Auto verkauft zu haben.

This strongly supports my claim that only *dass*-clauses have the possibility to be factive. Only finite clauses can have indexical mood and tense, and this is a necessary property of factive readings.

But there is more data to support my claim. If the matrix clause is negated, the complement is presupposed, but the matrix action does not seem to be the trigger of the presupposed state-of-affairs. These readings are marginal but the sentences are interpretable, especially if we compare them to their infinitival counterparts.

(40) ?Er hat ihr nicht erlaubt, dass sie das Auto verkauft hat.

(41) ?Er hat ihr nicht verboten, dass sie das Auto verkauft hat.

(42) *Er hat ihr nicht erlaubt, das Auto verkauft zu haben.

(43) *Er hat ihr nicht verboten, das Auto verkauft zu haben.

Again, we were able to 'suppress' the bound reading of an intensional predicate. While with factive *glauben*, the bound mood reading was excluded semantically. In the cases of influence predicates, independent temporal specifications do the job. Due to the temporal specifications, the bound reading of the entire complement is ruled out — the contrast with infinitival complement shows that additionally, we need indexical tense and mood in order to enforce a factive reading.

Do factive complements under influence predicates share the syntactic properties of genuine factives? They do, since complements with factive readings under influence predicates do not allow extraction:

(44) a. Sie ermöglichen ihr, dass sie in Italien studiert. (indexical mood/tense)

b. $[\text{In Italien}]_i$ ermöglichen sie ihr, dass sie t_i studiert. (transparent)

(45) a. Sie haben ihr ermöglicht, dass sie in Italien studiert hat. (indexical mood/tense)

b. *$[\text{In Italien}]_i$ haben sie ihr ermöglicht, dass sie t_i studiert hat. (intransparent)

Epistemic *derived de se* modals do not display this factive behavior:

(46) [In Italien] glaube ich, dass sie t_i studieren muss/soll. (propositional *believe*)

(47) [In Italien] glaubt er, dass sie t_i studiere. (propositional *believe*)

(48) *Er glaubt, wen sie liebe.

With indexical mood/tense in the complement, insertion of *die Tatsache* is possible:

(49) *Sie ermöglichen ihr die Tatsache, dass sie in Italien studiert. (*bound reading)

(50) Sie haben ihr die Tatsache ermöglicht, dass sie in Italien studiert hat.

As established in this thesis, factive complements can optionally be adjuncts. If we have past-under-past readings and rule out the bound reading (and trigger the factive reading), Principle C violations should be weaker with influence predicates. This prediction is borne out.

(51) Peter hat ihr$_i$ ermöglicht, dass Anna$_i$ in Italien studiert hat.

(52) Peter hat ihr$_i$ erlaubt, dass Anna$_i$ das Auto verkauft hat.

The factive readings occur with all influence predicates. With deontic predicates and with inherently negative predicates, sometimes the reading is odd, but this does not weaken my claim:

(53) Er hat ihr befohlen, dass sie das Auto verkauft hat.

In sum, I have shown that generally, all finite complements have an indexical interpretation which leads to a factive reading. This is the case even under influence predicates, and the resulting reading is a 'previous-event' reading for a presupposed effect.

Factive desiderative influence predicates Very marginally, there are factive readings under *wollen* as well:

(54) Ich habe nicht gewollt, dass du dir wehgetan hast.

We cannot consider this particular behavior of *wollen* irregular because semantically similar predicates like *beabsichtigen* share this property:

(55) Ich habe nicht beabsichtigt, dass du dir wehgetan hast.

(56) Ich habe nicht geplant, dass dein Vertrag nicht verlängert wurde.

There is a reading which presupposes the *dass*-clause. It is presupposed that the contract has been cancelled — and this fact is justified by the agentive decision. These desideratives are influence predicates and receive the 'previous event' reading which we already know from factive readings under circumstantial and deontic influence predicates. Example (54) seems to suggest that the subject's wanting would have the effect of the patient getting hurt. The hurting is a fact but it is denied that it was caused intentionally. Again, it is the indexical and 'breaking' temporal specification which triggers the factive reading.

I was able to show that for all intensional predicate subclasses, there are predicates which may receive a factive reading. This reading could be explained compositionally on semantic grounds. All of these examples show that conflicts with the semantic requirements of intensional predicates are responsible for this 'factivizing' effect. Crucially, this effect was traced back to the syntactic distribution. This provides evidence that, provided semantic plausibility, indexical mood and tense are the necessary and sufficient factors for factivity.

5.2 Predicates go intensional

If we assume that factive complements have to carry indexical mood and tense, we get into trouble with emotive predicates which are compatible with infinitival complements. This is the case with emotive factives:

(57) Peter ärgerte/freute sich sehr, Anna kennenzulernen.

For the analysis given in section 3.3.2, it is crucial that the subordinate tense is indexical. What happens with infinitival complements? Infinitival complements are tenseless, hence their tense variable has to be bound. There are basically two options.

– The first option is to assume that the tense variable is interpreted anaphorically, i. e. bound by the matrix tense. This is the case with perception predicates in infinitival complements (von Stechow, p.c.). We get (proper) simultaneity of the perception event and the perceived event. For factive predicates, this means that there is no binder provided by the factive predicate which blocks this binding relation. But

as indicated above, the matrix and embedded event are not always simultaneous since there are anterior readings. Still, anaphoricity might be an option for infinitival complements.

– Second, factive predicates might be potential binders for the zero tense variable in the complement. This would entail that factive predicates have a meaning which allows them to behave like attitudes if they 'have to' bind tense.

If tense is anaphoric in infinitival complements under factives, what is the interpretive effect of an infinitival complement under a factive predicate? The complement would have to remain in situ:

(58) Peter bedauerte es, Anna zu kränken.

(59) $(\exists e)(\exists t{<}s^*)$ [$\tau(e) \subset t$ & bedauern(Peter,e,e') & $(\exists e')(\exists t{<}s^*)$ [$t \subset \tau(e')$ & krank(Peter,e')]]

I am not sure about the interpretation in (59). Maybe it is similar to readings of weak indefinites — if we assume scope ambiguities for the difference between specific and non-specific readings of weak indefinites, we get a non-specific reading of the embedded event e' of Peter hurting Anna. The event variable is existentially bound. Peter regrets some event e' which is a hurting event of Anna.

We have already seen that tense and mood under factives might be anaphoric in conditional clauses. This first option is a reasonable way out of our dilemma. The only counter-argument is that I see no reason why this option should be ruled out for cognitive predicates:

(60) ??Peter ignoriert Anna zu kränken.

This is easier to explain under the second option, taking emotive predicates as attitudes marginally.

If factive predicates are potential binders on a marginal reading, present tense under a factive past matrix should be grammatical and receive an attitude-like interpretation.

(61) Peter freute sich gestern darüber, dass sie – dachte er – seine Kränkung sofort wieder vergisst.

(62) Er ärgerte sich sehr, dass sie den Mund schon wieder nicht hält, und nun hat er sie rausgeschmissen.

According to my intuition, it is marginally possible to interpret factives as subjective, i. e. to analyze them as potential binders. This corresponds to the observation that factive predicates involve a belief-relation as well, which holds at least for emotive predicates. Someone who bears an emotional attitude towards a fact will have a mental representation of this fact, i. e. believe the proposition exemplified by the fact and have an attitude towards this proposition (which is true in his belief worlds). This is supported by the fact that cognitives (which do not involve an emotional attitude towards a proposition) are rare with infinitival complements — cognitives are directly oriented toward a fact, while emotives have an attitude-like layer.

(63) Peter bedauert/freut sich, sie zu kennen.

(64) Peter ?ignoriert/?bemerkt/?merkt, sie zu kennen.

Furthermore, there are factive desire predicates. Heim (1992) is concerned with *be glad*. With indicative complements, it is factive:

(65) Peter war froh, dass Anna rechtzeitig kam.

I have argued that the complement is presupposed but that we need a counterpart relation to the belief worlds of Peter. Heim (1992) finds such cases in examples like:

(66) John$_1$ thought he$_1$ was late and was glad that Bill$_F$ was late too$_1$. [= Heim (1992), (55)]

The problem is that *too* indicates that there is a bridge between John's beliefs and the fact that Bill was late. The subject must have a belief about the fact. This makes the semantics of emotives (and cognitives) tricky. Whatever the most elegant way to represent this is, we get an interesting effect with infinitival complements:

(67) Peter freute sich darüber, dass er noch rechtzeitig kam. #Dabei war er zu spät. (non-subjective reading)

(68) Peter freute sich darüber, rechtzeitig zu kommen. Dabei war er zu spät.

(69) Peter bedauerte, Petra im Urlaub getroffen zu haben, dabei war es ihre Zwillingsschwester.

(70) Peter bedauerte, dass er Petra im Urlaub getroffen hat, #dabei war es ihre Zwillingsschwester.

In (67) the denial of the fact seems contradictory in a way. The presupposition of the first sentence cannot be denied that easily (but speakers' judgments differ with regard to these cases, a fact which will be explained below). By contrast, (68) works perfectly fine. When emotives in the default constructions involve a fact and an emotional attitude towards the (exemplified) belief of such a fact, then it is easy to conceptualize an emotive without a fact. Intuitively speaking, the predicate semantics is 'rich' enough to be informative without the factive ingredient. Hence, an emotive combined with an infinitival complement implies having an emotional attitude towards something the subject believes to be true.

Infinitival complements are restricted with cognitive predicates, at least cognitives seldom occur with infinitival complements.[2]

(71) Peter ahnte, dass er sie kannte

(72) ?Peter ahnte, sie zu kennen.

Ahnen can be paraphrased as to 'come to know something'. If this fact is not a fact — what should *ahnen* mean without a fact? The only interpretation which is accessible from the compositional viewpoint is to come to know something which is a belief, hence a 'subjective fact' since the holder will believe that it is a fact. But the speaker does not share this opinion. Cognitives with infinitival complements are very rare in written language — despite the fact that infinitival complements are preferred over finite clauses in written language. I assume that an infinitival complement under a cognitive will trigger a conversational implicature because the unexpected infinitival complement needs justification. Two possible ways to justify this are first to assume that the speaker was hypercorrect and used the infinitival complement where it was not expected in order to be formal. Or, secondly, the speaker wanted to explicitly not presuppose the truth of the complements. The implicature will give us that the speaker considers the complement to be counterfactual or subjective, as a look inside the holder:

(73) Ständig fegt einem ein Ast ins Genick oder man rutscht aus und zerrt sich irgendeinen Muskel, von dem man bisher nicht mal ahnte ihn zu besitzen. (Google)

[2]In the COSMAS subcorpus *mm* (newspaper texts from *Mannheimer Morgen*, 1995-2008), there are more than 800 sentences of *ahnen* with a *dass*-complement and none with an infinitival complement.

However, in this way, infinitival complements under cognitive factives are interpretable as well. Now let us go back to finite complements. Consider (74) and (75):

(74) ?Peter war froh darüber, dass er noch rechtzeitig kommt.

(75) ?Peter ahnte, dass er zu spät kommt.

If in these examples, tense is interpreted indexically, we get into trouble. How can Peter be glad about or come to know something which is not yet the case at the perspective time? Since this is impossible, these sentences are considered illogical. They are interpretable, however. Either we assume a double access reading which establishes a counterpart relation between the belief (in the past) and the present tense. This was described in section 2.2.2. Or, we interpret the finite complements as (derived) temporal and modal zero. This will correspond to the subjective reading with infinitival complements which are also zero tense and zero mood. This reading can be supported by parenthetical constructions like in (76) or with a sentence adverbial like *wahrscheinlich*:

(76) Peter war froh darüber, dass er – wie er glaubte – noch rechtzeitig kommt.

(77) Peter bedauerte, dass sie die Verabredung wahrscheinlich vergessen hatte.

Still, this does not quite save the *ahnen*-examples though:

(78) ?Peter ahnte, dass er – wie er glaubte – zu spät kommt.

(79) ?Peter ahnte, dass sie die Verabredung wahrscheinlich vergessen hatte.

I have suggested above that cognitives resist a subjective reading more than emotives because the factivity seems to be more essential to their lexical meaning. Uncertain belief (*wahrscheinlich* in (79) suggests that the holder is not sure about his belief as well) seems to be sufficient to have an emotion about this belief. Cognitives seem to require a higher grade of certainty at least on the part of the holder.

Hence, zero tense and mood may shift emotive predicates to propositional predicates.

Does this class shift correlate with syntactic behavior?

If we extract a constituent from the complement, we trigger the attitude reading:

(80) ?Nach Italien$_i$ bedauerte Paula, dass Peter t$_i$ fährt.

(81) *Nach Italien$_i$ bedauerte Paula, dass Peter t$_i$ fuhr.

Consequently, (80) is marginally acceptable because we can easily get the propositional reading. In (81) we exclude the factive reading that we had for past-under-present in (81) and only the very marginal bound relative past attitude reading is possible.

According to the observations of Müller & Sternefeld (1995), infinitival complements are transparent in environments where finite clauses are not:

(82) a. ?Wohin bemerkt Peter, dass er fährt? (OK in 'subjective' reading)

b. Wohin bemerkt Peter zu fahren?

(83) a. ?Wohin bedauert Peter, dass er fährt? (OK in 'subjective' reading)

b. Wohin bedauert Peter zu fahren?

I am not convinced that this has syntactic reasons. As shown in (82), infinitival complements are transparent for extraction under factive predicates. This, in fact, follows from my approach if we assume that a semantic reinterpretation is at work. The factive predicate is interpreted as an attitude.

Similar to V2-complements which trigger a verbum *dicendi reading*, extraction triggers a propositional reading. Hence, C^0 is marked with the feature [TENSE/MOOD] and hence it is visible for the embedding predicate (or to be more precise, to the underlying attitude in factive predicates). It follows naturally that infinitival complements allow extraction — but that they will not be factive.

5.3 Implicatives

5.3.1 Cognitives and implicatives

There are predicates which seem to be relatively sensitive to changes in the complement type, or to put it differently, predicates which are flexible

enough to adapt their core meaning depending on the complement type. They are implicative when the complement is an infinitival clause and factive when the complement is a *dass*-clause. A typical example is *vergessen*:

(84) Er vergisst zu rauchen. (implicative)

(85) Er vergisst, dass er raucht. (factive)

This effect is not idiomatic and unpredictable. However, I will show that the effect is systematic.

The subset of predicates which are sensitive to this implicative-factive shift have certain properties in common. First, they are all cognitive factives, but not all cognitive factives allow this shift.

(86) a. Er denkt daran, einen Fehler zu machen. (implicative)

b. Er denkt daran, dass er einen Fehler macht. (factive)

(87) Others: *jm. erinnern, daran denken, nachdenken über, vergessen, davon reden* (in a reading similar to *mit dem Gedanken spielen*).

(88) a. *Er entdeckt, einen Fehler zu machen.

b. Er entdeckt, dass er einen Fehler macht. (factive)

(89) Others: *bemerken, beobachten, entdecken, erfahren, erkennen, fühlen, herausfinden, jm. klarmachen, merken*

Our task now is to find the difference between the first and the second group. I propose that all predicates in the first group involve acquaintance with a fact, and this acquaintance is referred to in the relevant situation. To remind someone is to remind him of a fact which he was acquainted with before. To remember something is to come to know something which one already knew. To consider something is to think about something we know or more generally, something we have a mental representation of. This distinguishes the shiftable predicates from those which resist shifting into an implicative. It seems like having a mental representation of something is the core meaning cognitives and their implicative counterparts share. On the implicative side, having something in mind may be conceptualized as a sufficient precondition to actually performing the action. Note that I am talking of an action now since implicatives are modifiers on actions. Cognitives which express an event of receiving acquaintance with a fact for the first time will not become implicative.

(90) Peter denkt daran, dass er Petra gekränkt hat.

(91) Peter denkt daran, Petra zu kränken.

here, the situation is anchored in the past time of the actual world with the finite clause. With the (bare) infinitival complement, the mental representation of a hurting-situation is sufficient for performing it. Since — perhaps due to grammaticalization — having a mental representation *and* performing an event which is related to the mental representation fuse to form one event, negation in the matrix clause will affect and negate the whole event.

I was able to show that the factive-implicative shift is not unpredictable but follows certain conditions. The basic requirement that implicative predicates select not for propositions but for actions is supported.

Similarly to perfect infinitives, state-denoting complements are not compatible with implicative predicates. With individual-level predicates like *intelligent sein*, either we have to re-interpret it as agentive (for instance, to forget to *pretend being intelligent*) or we get the attitude (subjective, not factive) reading.

(92) ?Er vergisst, krank zu sein.

(93) ?Er denkt daran, blond zu sein.

I have assumed the denotation of the complement to be an event. Statives cannot denote sets of events because they denote properties of times (cf. Katz (1995), Kratzer (2000)). For this reason, they are too complex for complementation to an implicative predicate. Since there is no event variable, the event cannot be modified. The examples in (92) and (93) are odd, however, because due to the infinitive, they cannot be re-interpreted as factive. I have suggested that cognitives with infinitival complements get a subjective reading. This reading is odd with being ill or being blond because one has the impression that this is a matter of objective perception. Better are examples like the following. Example (94) is not factive but the experiencer brings a subjective belief back to mind.

(94) Er dachte daran, gekränkt worden zu sein. (Naja, er hatte es sich sowieso nur eingebildet.)

This finding follows from my approach. If statives denote properties of times, they are very close (or even identical) to propositions which denote intensionalized properties of times.

The fact that with this subset of predicates shifting is so common shows that they do not have to be coerced but are compatible with both sets of syntactic and semantic requirements. This follows from the fact that factives and implicatives share many properties: both do not m-select their complement and do not provide lexical binders for tense and mood in their complements. As was shown here, it is mainly a matter of semantic plausibility whether a predicate is factive or implicative. Implicatives which do not involve a certain mental state (i. e. *es wagen, es schaffen*) are not shiftable into factives. Intensional predicates are different from implicative predicates. There is very little overlap between the two predicate classes.[3]

5.3.2 Summary

	Factives	Attitudes	Influence predicates
Emotives	-	bound mood	*
Cognitives	-	bound mood	*
Attitudes	indexical mood	-	(desire + modals)
Influence	indexical mood	*	-
Implicatives	indexical mood	*	*

How can we 'make' a factive predicate? It is a central claim of this thesis that many intensional predicates can be turned into a factive. This can be done by 'suppression' of the bound zero reading in the case of attitudes. This gives us indexical mood and tense. There are semantic restrictions. An implicative predicate can only be shifted to a factive if either it is a cognitive (with additional requirements, see section 5.3) (or — very restrictedly — it is a two-step-derivation via an influence predicate). In this case, we will have to establish a functional temporal and modal domain and interpret mood and tense indexically.

Attitudes can only be derived from emotive factives. I have not found any convincing examples of implicatives or influence predicates turned into intensional predicates. This is because only emotives fulfill the lexical requirements (an attitude level) to obtain as an attitude.

[3]For instance, we might assume that propositional predicates which allow for restructuring — hence behave syntactically like prototypical implicative predicates — may be shifted into implicative predicates. However, since there are so few intensional predicates which clearly allow restructuring, I will ignore this option.

Modulo semantic appropriateness, a predicate can be made implicative via incorporation of the functional domains. Implicative predicates are very restricted semantically. Doing stems from mental (sometimes intentional) states. Formally, we can derive this reading whenever we use infinitival complements with certain cognitive factives.

Chapter 6

Conclusion

It has become clear that finite complements marked with the feature [TENSE] share many properties with infinitival complements. Both carry zero tense and zero mood and thus may denote intensionalized properties of times (and individuals). This qualifies both to be complements of intensional predicates. I have shown that intensional predicates in a concept position involve relations which may be relations between times and between worlds. All intensional predicates involve modal quantification. I have shown that optionally, modals and mood as well as pronouns and tenses can be interpreted *derived de se*, i. e. they express the default relation between the variables as provided by the lexical semantics of the predicate. They are derived zero pronouns which means that they are interpreted but are 'recognized' in the semantic derivation. *Derived de se* readings only exist in finite complements. The individual, time and world variable in infinitival complements has to be interpreted according to the default relation because they are obligatorily bound by the lexical binders provided by the embedding predicate. Hence, there are differences between finite and non-finite complements, but nonetheless both are possible complements for intensional predicates.

For factive complements, definite situations are most acceptable as the argument. This requires indexical mood and tense which in turn allows movement at LF in order to have the event variable existentially bound. An infinitival complement may be interpreted under certain circumstances, but the unbound event has to be bound by existential closure or bound by the embedding predicate (which leads to an attitude-like reading). Consequently, infinitival complements may be eventive or propositional but rarely presuppositional.

Implicative complements need to have zero time and world variables which are anaphoric with matrix tense and mood. If we assume that implicative complements are categorially smaller than CPs, i. e. lack a TP, they are tenseless and form an event sum with the matrix predicate. This summation is either supported by tenselessness or due to non-distinctness (strict identity of times and worlds, exhaustive control) of the functional projections of the matrix and the embedded clause. Semantically, the complement denotes an action or an event which is modified.

Crucially, I have shown that there is not only a correlation between the syntactic and semantic behavior of the complement classes and their control predicates, but additionally, this form-function fit allows us to shift predicates from one predicate class to others. Class shifting can be traced back to a semantic trigger but has specific syntactic effects. This shows that these semantic and syntactic properties are not epiphenoma of abstract class membership but really *form* the structural properties which determine syntactic and semantic properties.

Table 6.1: Default complement types of predicate classes

Predicate	complement
Attitudes	zero mood/tense
Factives	indexical mood/tense
Implicatives	moodless/tenseless

The default complement types of predicate classes are shown below.

Table 6.2: Default complement types

Complement	tense-/moodless.	zero mood/tense	indexical mood/tense
Infinitival	+	+	–
Finite	–	+	+

Zero variables can be expressed both by finite (derived) and by non-finite complement clauses. Hence, there are many predicates which may have both complement types. They can be substitutes under attitudes and under influence predicates. Implicative predicates require a moodless and tenseless complement. Factive complements need indexical mood and tense, hence only finite *dass*-clauses can be their complements whenever there is one single situation referred to.

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